96th year
JULY 1954
Vol. 181—No. 1
AMERICAN
Gas Journal

Readily Adaptable ROCKWELL "015" REGULATORS

You can apply any of these automatic control systems to the same basic body. Use this feature to adapt existing Rockwell regulators to changing pressure conditions and requirements. Save in time and money.

THE BASIC "015" REGULATOR BODY
ACCEPTS ANY OF SIX CONTROLS

YOU CAN RELY ON ROCKWELL

ROCKWELL MANUFACTURING COMPANY

PITTSBURGH 8, PA. Atlanta Boston Chicago Houston Los Angeles New York
N. Kansas City Pittsburgh Philadelphia San Francisco Seattle Tulsa

In Canada: Peacock Brothers Limited

NOV 18 1954

HOW MUCH

Did Your Obsolete Meters Cost You Today?

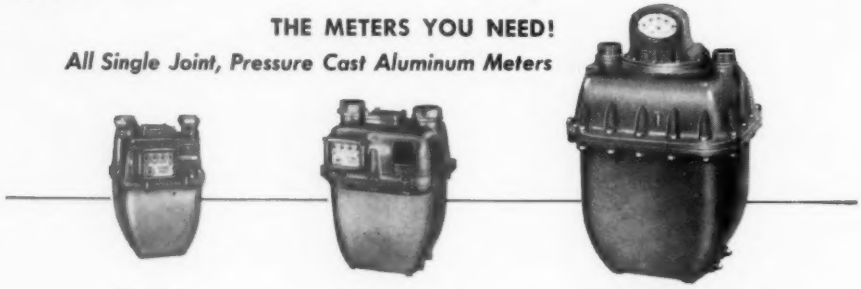
The fastest way for any product to become obsolete is for someone to develop an improved one to do the same job better and more economically. That applies to meters and when it comes to constant efforts to improve our products, we plead guilty.

Our new model aluminum meters incorporate the latest advances in design, engineering, styling and materials. Older models never could compare, even when new, with the performance we're building into meters now.

We believe you owe it to your company to know what's new and better in meters—and what old, obsolete meters are costing you. Let our representative show you proof—proof that a carefully planned program of meter replacement will materially improve your measurement, increase your revenue and cut meter maintenance so drastically that it will more than pay for itself.

THE METERS YOU NEED!

All Single Joint, Pressure Cast Aluminum Meters



No. 150 **No. 415** **No. 800**

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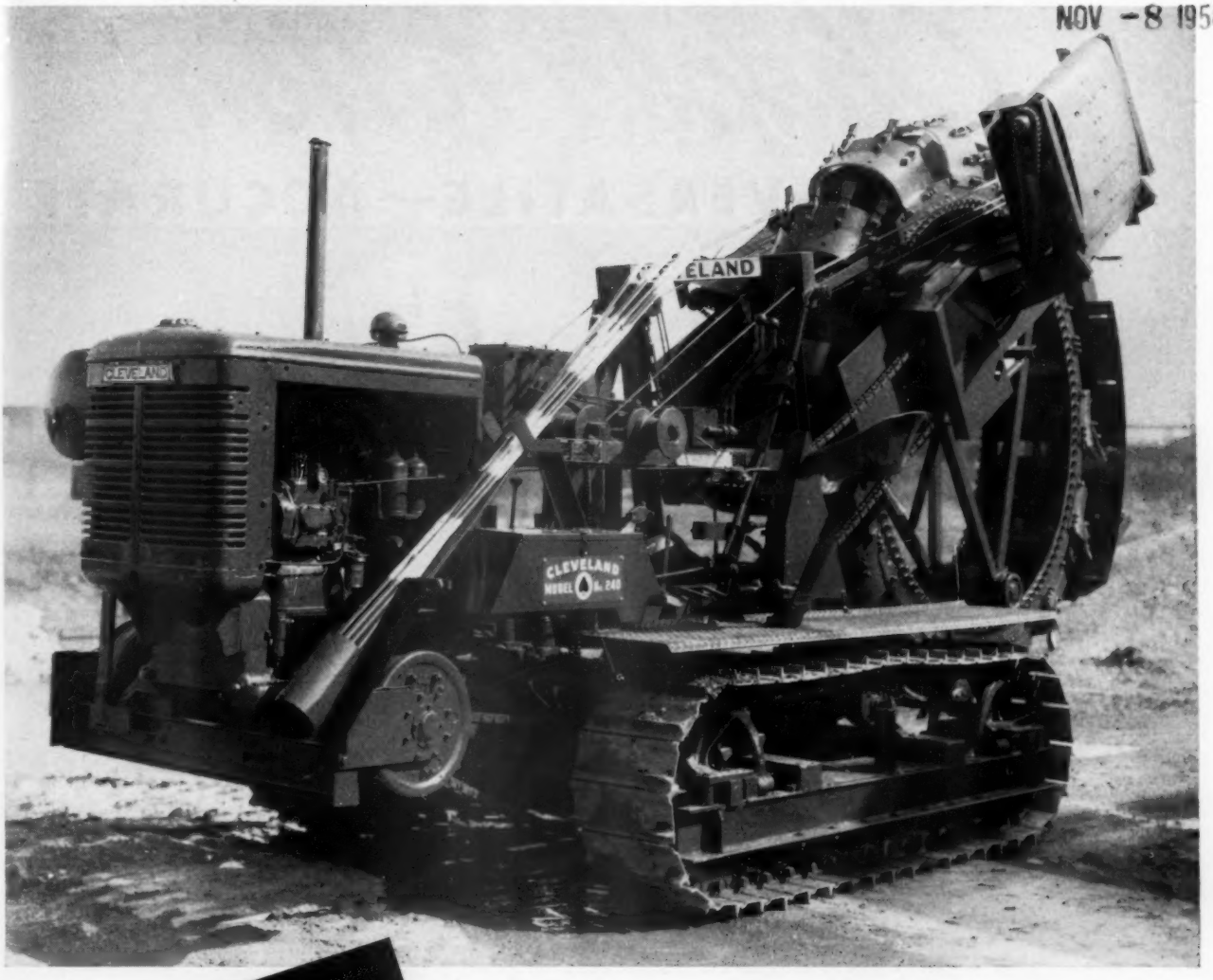


A Great New CLEVELAND

The Model 240

DIGS 20"-36" WIDE, DOWN TO 6'3" DEEP

● This powerful new trencher possesses all the famous time-proved CLEVELAND advantages—plus valuable new features that make it the finest trencher of its size and capacity ever built.

It is built to deliver—*is now delivering*—outstanding digging performance...

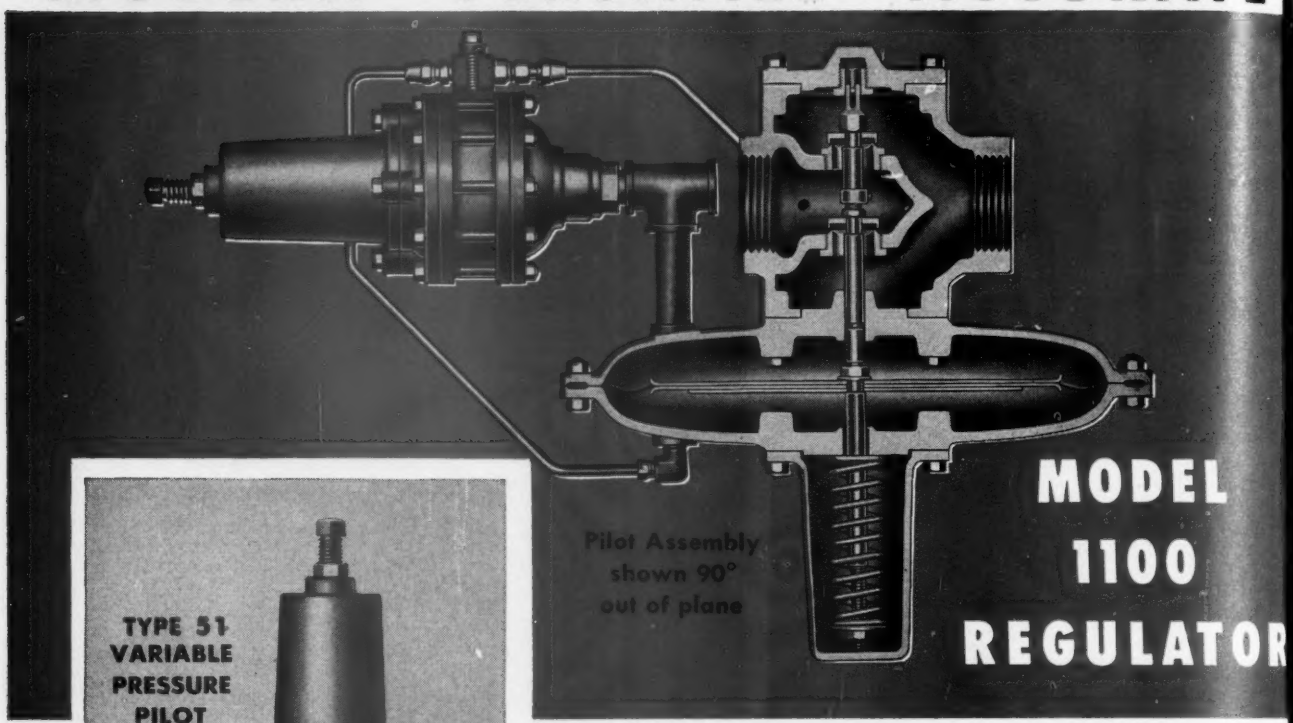
For Trench Work of Every Kind
PIPELINES • UTILITIES • DRAINAGE • IRRIGATION, ETC.

Ask Your Local Distributor for Bulletin S-119, or Write:
THE CLEVELAND TRENCHER CO. • 20100 ST. CLAIR AVENUE • CLEVELAND 17, OHIO

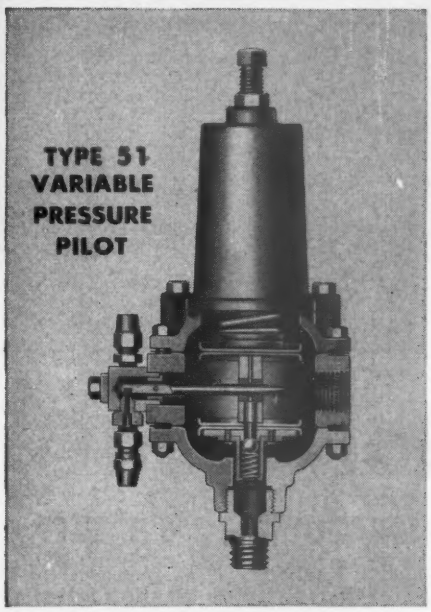
CLEVELAND

Chaplin-Fulton

MODERN—VERSATILE—ACCURATE



MODEL 1100 REGULATOR



TYPE 51 VARIABLE PRESSURE PILOT

• the heart of the MODEL 1100 assembly, insuring precisely accurate control over the complete flow range. • Unitized construction—valve lever and orifice as a unit are removed from the outside, without disturbing balance of assembly. The likely trouble spot—the orifice—is placed outside where you can get at it quickly—no internal tubes to clog. • Twin diaphragms remove as a unit. • Internal relief unit—guards against overpressure. • Spring unit—remove three screws to change springs. • Built for service. • Used for accuracy.

You can't buy, beg, borrow or steal a more versatile pressure regulator than MODEL 1100. Nor has traditional Chaplin-Fulton ruggedness, simplicity or accuracy been forgotten in this new modern design. Size—2″ only.

Wider Application —Inlet Max.—250 psi. Outlet Range—1″ to 75 psi or 50 to 150 psi.

Greater Capacity —24,000 CFH at 10 psi to ounces; 114,000 at 100 psi. Body contoured for flow.

Easier Maintenance—regulator or pilot can be serviced without disturbing the other. Quickly accessible orifices in both, easily renewable.

Simpler Installation—only one connection required. No complicated pins or toggles to adjust.

You can standardize on MODEL 1100 for a wider range of your industrial, commercial or distribution installations.

ACCURATE CF MFG CO. DEPENDABLE

Chaplin-Fulton

MANUFACTURING COMPANY

Pittsburgh 25, Pennsylvania

AMERICAN GAS JOURNAL, July, 1954. Vol. 181, No. 1. Published monthly (except October, then semi-monthly), by American Gas Journal Inc. at 73 Main Street, Brattleboro, Vt. Entered as second class matter January 24, 1950, at the post office at Brattleboro, Vt. under Act of March 3, 18[illegible] Executive and editorial offices at 205 East 42nd St., New York 17, New York. Subscription prices, U.S. $3 per year; Canada $4; Foreign $10. Single copi[illegible] 50 cents, except October 1 issue, which is not sold separately. Printed in U.S.A.

AMERICAN Gas Journal
96TH YEAR OF PUBLICATION

VOLUME 181 JULY 1954 NUMBER 1

This month...

AMERICAN GAS JOURNAL, with this issue, enters its 96th year of continuous publication for the gas industry.

On Friday, July 1, 1859, the editor of the JOURNAL . . . he was shrouded in anonymity by "the proprietors"(!) . . . wrote that

it is our intention to enlarge and extend the JOURNAL, *to keep pace with the requirements made upon it. All new inventions relating to the gas-light interest; all legal decisions affecting the rights of companies or consumers; all new and projected works—in fine, every item of intelligence affecting it, will be embraced in its columns: so that it shall be the standard authority, in this country, for that department of science.*

More-recent editors, unencumbered by anonymity, have reiterated the founding-editor's intention and have dedicated themselves sincerely to his basic objective.

With a gleam in his eye, no doubt, our unnamed predecessor made it clear that

a remittance of THREE DOLLARS *will ensure the receipt of the* JOURNAL *for one year, postage prepaid.*

With our own gleam, we note $3 still will ensure that.

• • •

In the spirit of a birthday remembrance for the JOURNAL, the editors have presented it with figurative new-hat-and-tie. Appropriate changes in the head of our front cover and the type at the heads of our articles have been designed to give both enhanced readability and greater attractiveness.

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Hilding H. Carlson · Editor

Bernard W. Morris · News Editor

Charles R. Bellamy · Technical Editor

Arthur Rohman · Western Editor **John F. Falvey · Financial Editor**

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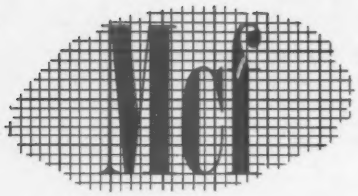

LOOKS as though both Canadian Dominion and provincial governments outsmarted themselves by not taking prompt and positive steps to give official assurance of continued dependability of gas flow into Northwest U.S. Royalties estimated at $15-million annually went *poof* when FPC granted certificate to Pacific Northwest Pipeline.

NEIGHBORLY door would seem to be open to Canadian gas for Northwest U.S., in view of FPC Chairman Kuykendall's comments regarding a Canadian project as "probably . . . the soundest . . . to provide gas to the Pacific Northwest area." Actually, as things stand, chances for such a reconsideration are slim.

INDUSTRY has heard a lot about high temperatures. Here's one on the low-end of the scale. Arthur D. Little, Inc., says research near absolute zero, that's *minus* 460F, is beginning to pay off. One application being considered is the liquefaction of the bulk of a natural gas stream so that nitrogen can be vented as a gas, leaving a larger proportion of combustibles for pipeline or liquid bulk transportation.

FPC's current organization, staff, facilities and procedures will be strained to the breaking point when the new volume of work implicit in the Supreme Court's decision in the Phillips Petroleum case is undertaken. The Commission can be expected to simultaneously review all its gas, electric and water power operations.

THIS is the way Mrs. America Contest shaped up on June 24, the gas company voting-deadline: 73 companies in 28 states, representing 10,625,805 meters voted "Yes." That is 42% of the total meters in AGA member-companies. The companies include 5 of the 8 that have 1-million-or-more meters. While the contest is *in*, it certainly is not too late for more companies to get in with their late-but-still-significant "Yes" votes.

INTERCOM is the title of "a periodic report to persons concerned directly with public relations in the gas industry." It is new; issued by the public relations bureau of American Gas Association to provide practical materials, ideas and techniques of successful PR programs. Here is capably capsulated information, long needed, and arranged with easy-to-find subheadings. Get a copy from AGA.

ANOTHER state commissioner has been nominated to FPC by President Eisenhower—this time, Frederick Stueck, former Missouri commission chairman. Earlier, it was Jerome K. Kuykendall, now FPC chairman, and formerly of the Washington state commission. This seems to be the President's pattern; an FCC vacancy was filled recently with a former Wisconsin chairman. A hazy memory dredges up a sorry note, 2-or-more years old, with somebody-or-other kicked out of the Interior department and then roosting right on FPC.

SEARCH for natural gas goes on in Great Britain. Our esteemed 106-year-old counterpart, *Gas Journal* (London), reports that exploratory drilling to 2,000 feet has not provided "very satisfactory results." Presence of gas was confirmed; but no production. But, they're drilling more holes. More and deeper holes—*that's* the real basis for the development of natural gas in the U.S.

GAS is back in the Washington news in a big way; some developments will stand close surveillance. There's the Phillips case . . . Hinshaw amendment to Natural Gas Act . . . Ferguson bill . . . gas industry safety legislation.

PHILLIPS case is discussed on page 14.

HINSHAW amendment exempting *intra*state gas distributors from FPC jurisdiction would appear to be subject to open-and-shut interpretation, but FPC comes up with rule that, in effect, will give exemption only on application. That's the tenacity-in-bureaucracy technique.

FERGUSON bill, dead for *this* session of Congress, would amend Natural Gas Act to establish original or actual costs of company-owned gas reserves as rate bases. Senator Ferguson, after postponement of action on the bill, urged FPC to put natural gas rates under an immediate freeze.

SAFETY in the gas industry at a high-and-ever-improving level notwithstanding, there is apparent strength in the brewing Federal gas safety code. Bill HR 134, now in committee and supported by FPC and National Association of Railroad and Utilities Commissioners, would prescribe requirements for gas companies. FPC, while favoring a code, does not want any part of its enforcement. Frederic A. Hough, Southern Counties Gas Co., representing the gas industry safety code committee before the House interstate commerce committee, reported that the industry's own code will be finished December 1 and, pointedly, that "there are compelling reasons that make it extremely unwise for any company to fail to comply with a code that has the backing of industry. . . ."

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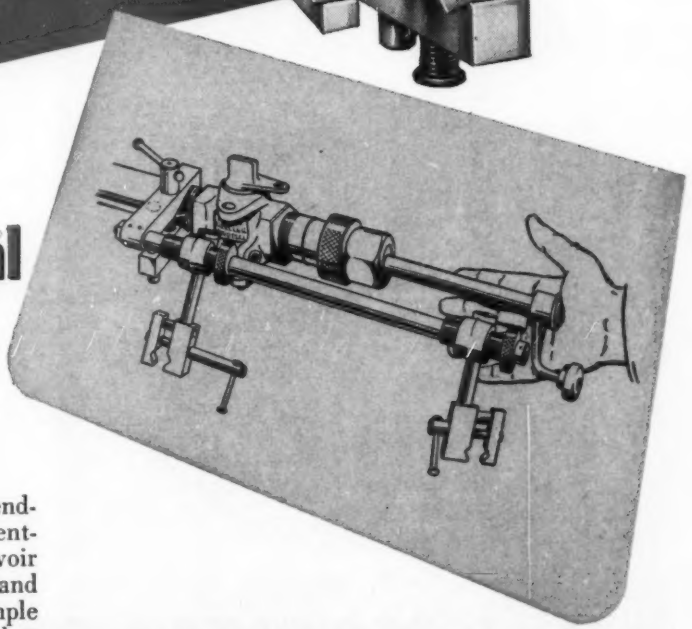
MUELLER®

LubOseal stops and NO-BLO stop changer



Now! INSTALL LubOseal STOPS UNDER PRESSURE— WITH THE NEW MUELLER NO-BLO STOP CHANGER!

Replace leaking or damaged gas meter stops with dependable LubOseal Stops. "O" rings provide permanent-leak-proof seals at top and bottom. Lubricant reservoir gives automatic lubrication of precision-ground and lapped key. False ports, low-turning torque, easy, simple re-lubrication, tamperproof construction and many other features guarantee long life and safe operation.

And the new Mueller NO-BLO Stop Changer permits the LubOseal to be installed safely and quickly without bucking gas or shutting off the service.

Look for our latest cartoon-style "how-to-do-it" ad on the following two pages, showing the simple step-by-step procedure for replacing meter stops using the NO-BLO Stop Changer.

MUELLER CO.

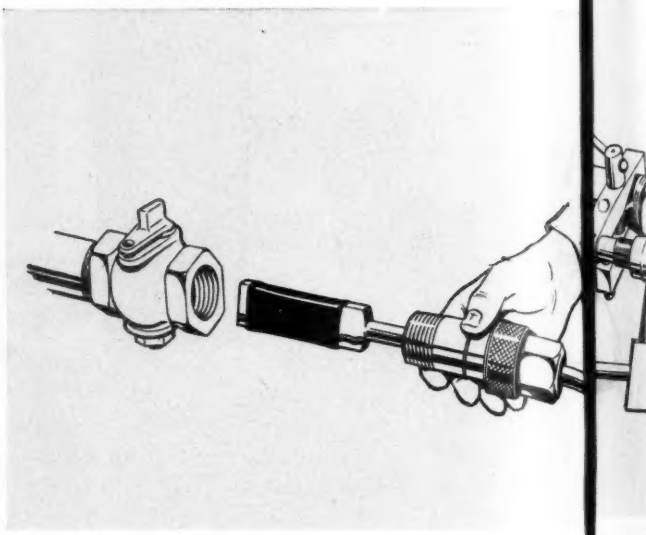
Dependable Since 1857

MAIN OFFICE & FACTORY DECATUR, ILLINOIS

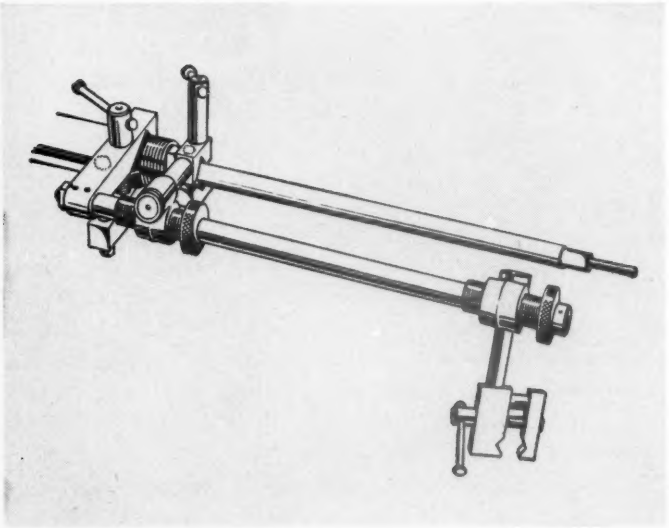
Contact your Mueller Representative or write direct for full details.

Now! replace gas stops.

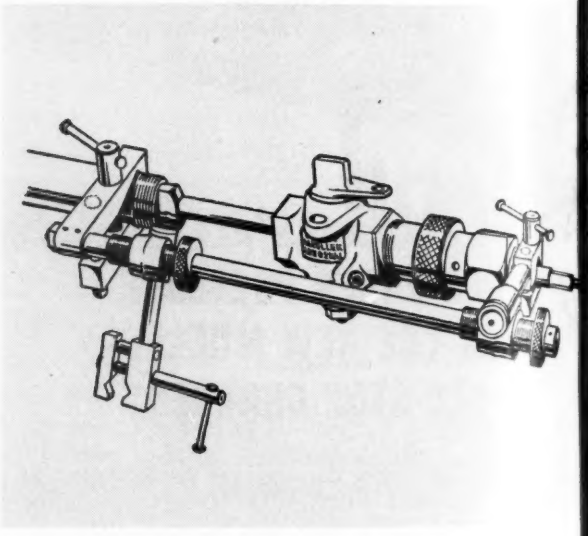
The new Mueller No-Blo Stop Changer makes it possible to change or replace gas stops safely, quickly and simply under pressure without loss of gas. Consider these simple steps of the latest Mueller No-Blo Method!



STEP 1. ATTACH STOP CHANGER TO OLD ST
CLOSE STOP. REMOVE HOUSE PIPING FROM O
LET AND ATTACH NO-BLO STOP CHANGER.



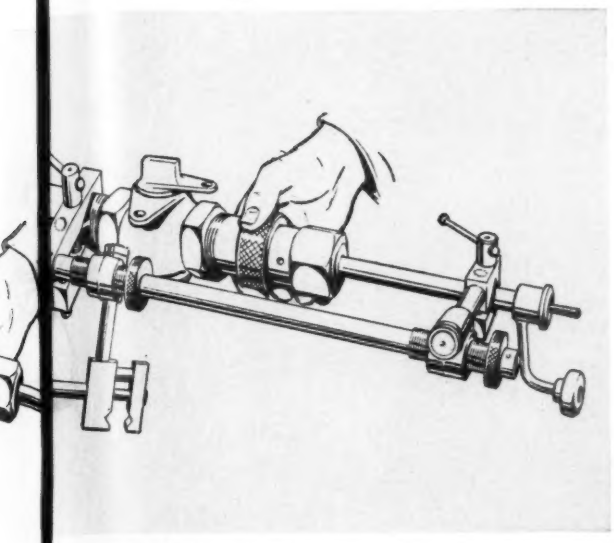
STEP 4. REMOVE OLD STOP.
RELEASE REAR CLAMP. REMOVE STOP AND PRESSURE CHAMBER FROM SHAFT. (FRONT CLAMP HOLDS STOPPER IN POSITION.)



STEP 5. SLIDE NEW STOP ONTO SHAFT.
SCREW PRESSURE CHAMBER ONTO NEW STOP A
SLIDE ONTO SHAFT. TIGHTEN REAR CLAMP
SHAFT. RELEASE FRONT CLAMP.

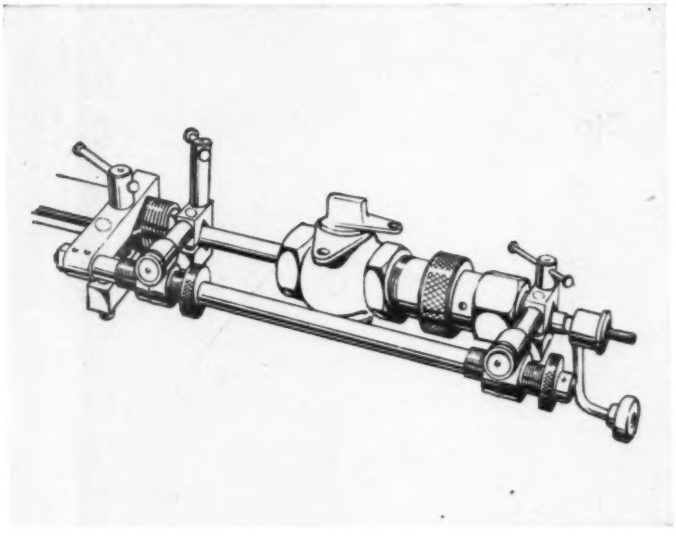
MUELLER NO-BLO **Method**

Safely . . . under pressure!



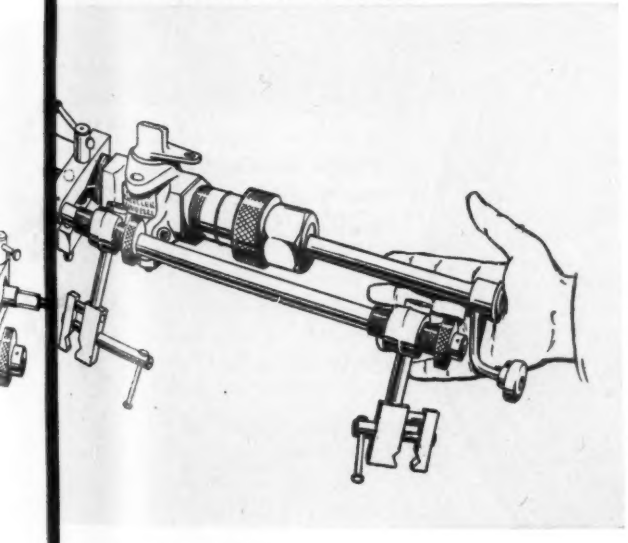
2. INSERT AND EXPAND STOPPER.

H SAFETY CLAMP TO PRESSURE PIPING. STOP AND INSERT STOPPER. TIGHTEN REAR P ON SHAFT AND EXPAND STOPPER. TEST TIGHT SHUT-OFF BY SLIDING "O" RING COLLAR ARD TO EXPOSE TEST HOLE.



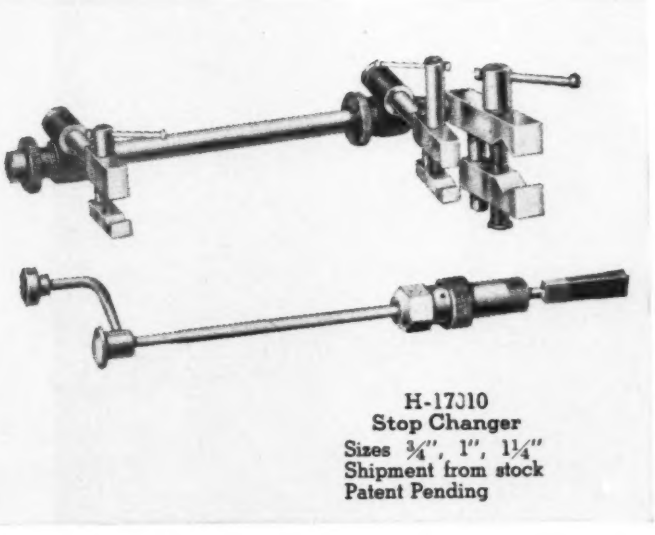
STEP 3. UNSCREW OLD STOP.

UNSCREW OLD STOP AND SLIDE TO REAR OF SHAFT. TIGHTEN FRONT CLAMP ON SHAFT. (NOTE: THREADED SLEEVES POSITION SAFETY CLAMPS.)



6. INSTALL NEW STOP.

W NEW STOP ONTO PIPE. RELEASE STOPPER WITHDRAW THROUGH STOP. CLOSE STOP, TEST EAKS AND REMOVE NO-BLO STOP CHANGER. ECT HOUSE PIPING AND OPEN NEW STOP TO PLETE INSTALLATION.



H-17310
Stop Changer
Sizes ¾", 1", 1¼"
Shipment from stock
Patent Pending

View shows shape of stopper which permits it to pass through a straightway stop. "O" ring seal is located between Pressure Chamber and shaft. When expanded, the stopper assumes circular shape and effectively stops-off gas pressures of 125 psig. Note test hole in Pressure Chamber and sliding "O" ring test collar—used to test for effective stop-off during installation.

s another of a series showing the broad ations and step-by-step installations of r No-Blo Machines and Fittings.

dditional information consult your Mueller tative or write direct.

MUELLER CO.

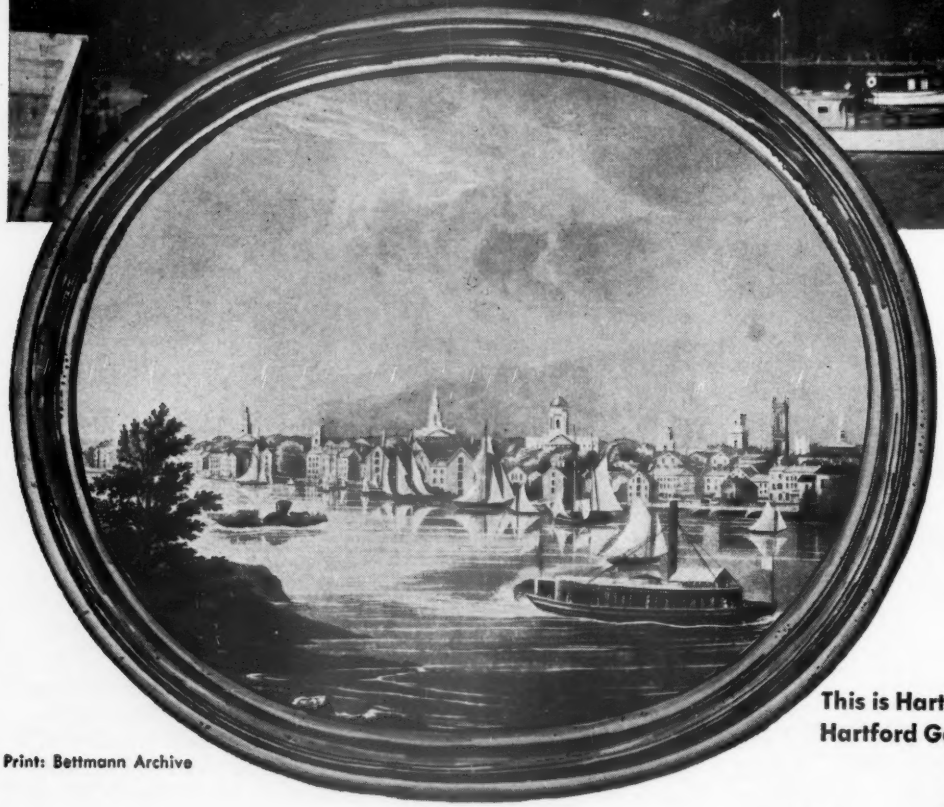
Dependable Since 1857

MAIN OFFICE & FACTORY DECATUR, ILLINOIS

Once a customer

Photo: Black Star

This is Hartford, Conn., the "Insurance Center of the Western Hemisphere".



Print: Bettmann Archive

This is Hartford as it looked in 1848 when Hartford Gas Company was founded.

MODERNIZED cast iron

ALWAYS a customer—generation after generation!

HARTFORD GAS COMPANY bought cast iron pipe 100 years ago—and buys it today

Hartford Gas Company (formerly Hartford City Gas Light Company) was granted its original charter in 1848. Population of Hartford was then 18,000. In 1849 cast iron distribution mains were laid. One of these mains recently was uncovered and found in good condition after 100 years' service (see cut). Today, this progressive Company is serving 67,000 customers with 535 miles of mains. It has recently completed conversion to a new 800 B.T.U. mixed gas to meet the needs of Greater Hartford's more than 300,000 population.

In good condition after 100 years of service, this cast iron gas main is still functioning as part of Hartford Gas Company's modern distribution system.

A famous jurist defined *good will* as "the probability of the customers' returning to the old stand." Hartford Gas Company has been buying cast iron pipe for more than a century. And, even though the pipe they laid in 1849 was made without benefit of engineering specifications, metallurgy and modern quality controls, some is still in service.

Today's *modernized* cast iron pipe—centrifugally cast and with standardized mechanical joints, is even more economical and efficient. The pipe is stronger, tougher, more uniform in quality. The mechanical joints are bottle-tight for usual gas pressures and for all types of gas.

Cast Iron Pipe Research Association, Thos. F. Wolfe, Managing Director, 122 So. Michigan Avenue, Chicago 3, Ill.

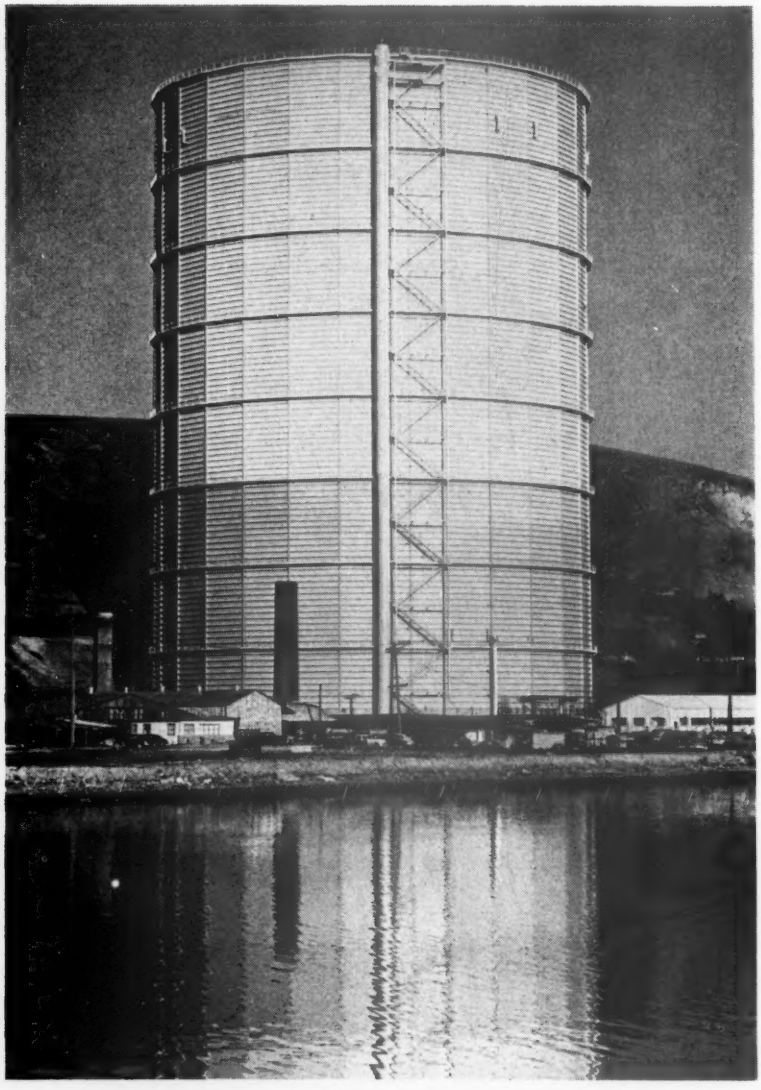
CAST Q IRON

The Q-Check stencilled on pipe is the Registered Service Mark of the Cast Iron Pipe Research Association.

pipe FOR MODERN GAS DISTRIBUTION

Over 75 Waterless Gas Holders testify that

Koppers Engineering means sound construction



IN 1924, the Bartlett-Hayward Company, now part of Koppers, introduced the waterless gas holder in this country. Since then, Koppers has erected over 75 of these holders for more than 30 public utilities and industries, storing a major percentage of all the gas stored in holders in this country. This record could only have been achieved by Koppers reputation for well-built holders.

Capacities to 22,000,000 Cu. Ft.

Koppers experience and facilities enable us to handle any waterless gas storage application from 60,000 to 22,000,000 cubic feet capacity. And every holder is engineered to give you greater storage capacity on less ground area. This design cuts your foundation costs.

Low Construction and Maintenance Costs

Koppers unique construction methods eliminate scaffolding, reduce erection costs. Each step of construction undergoes rigid inspection to conform with principles based on years of experience. Maintenance costs are low, too. A tar film protects the shell interior from corrosion and no part of the holder comes in contact with water. The tar pump requires only minimum attention and its infrequent operation for short periods of time means lower power costs. In the winter, the holder roof protects the piston from snow and ice. Over 80% of the holders in service do not require any heating for winter operation. On those that require tar conditioning, the heating facilities required are less than one-fifth the size necessary for water type holders of comparative size. For additional detailed and technical information, write KOPPERS COMPANY, INC., Gas Apparatus Department, Metal Products Division, 217 Scott St., Baltimore 3, Maryland.

KOPPERS®

GAS APPARATUS

METAL PRODUCTS DIVISION • KOPPERS COMPANY, INC., BALTIMORE 3, MD.

This Koppers Division also supplies industry with Fast's Couplings, American Hammered Industrial Piston and Sealing Rings, Koppers-Elex Electrostatic Precipitators and Aeromaster Fans.

Engineered Products Sold with *Service*

TESTS PROVE!

"SERVEL refrigerator is a better load builder than the Gas Range!" ...says C. L. BENN

2 SERVEL ADVANTAGES PROVED!

1 Tests indicated monthly consumption by gas range of 1.233 H.C.F. per range ... and 1.38 H.C.F. for the Servel Refrigerator. Servel maintains and boosts your gas load better than the average gas range!

2 The independent Pittsburgh tests proved the Servel gas refrigerator is more economical in the consumer's home than any other type of refrigerator. Eight-day tests were conducted under closely controlled conditions, using an electric and gas refrigerator of comparable capacity. Fuel costs per month showed electricity at $1.56 and gas at 90¢. This Consumer-Saving is a powerful advantage in selling the appliance that does most for you!

Gas Refrigerator superiority proved in independent tests conducted by C. L. Benn, Chief Utilization Engineer of Equitable Gas Company, Pittsburgh, Pa.

THESE FEATURES SELL SERVEL!

- Ice "Cubes" Automatically ... no messy ice trays!
- 10-year warranty ... with no motor to wear out!
- 3 appliances in 1 ... refrigerator, freezer, ice-maker!
- Huge separate freezer ... up to 80 lbs. of frozen foods!
- Automatic Defrost ... completely carefree!
- Door shelves ... and adjustable interior shelves!

A complete selection of fully automatic gas water heaters in a range of sizes to fit every need.

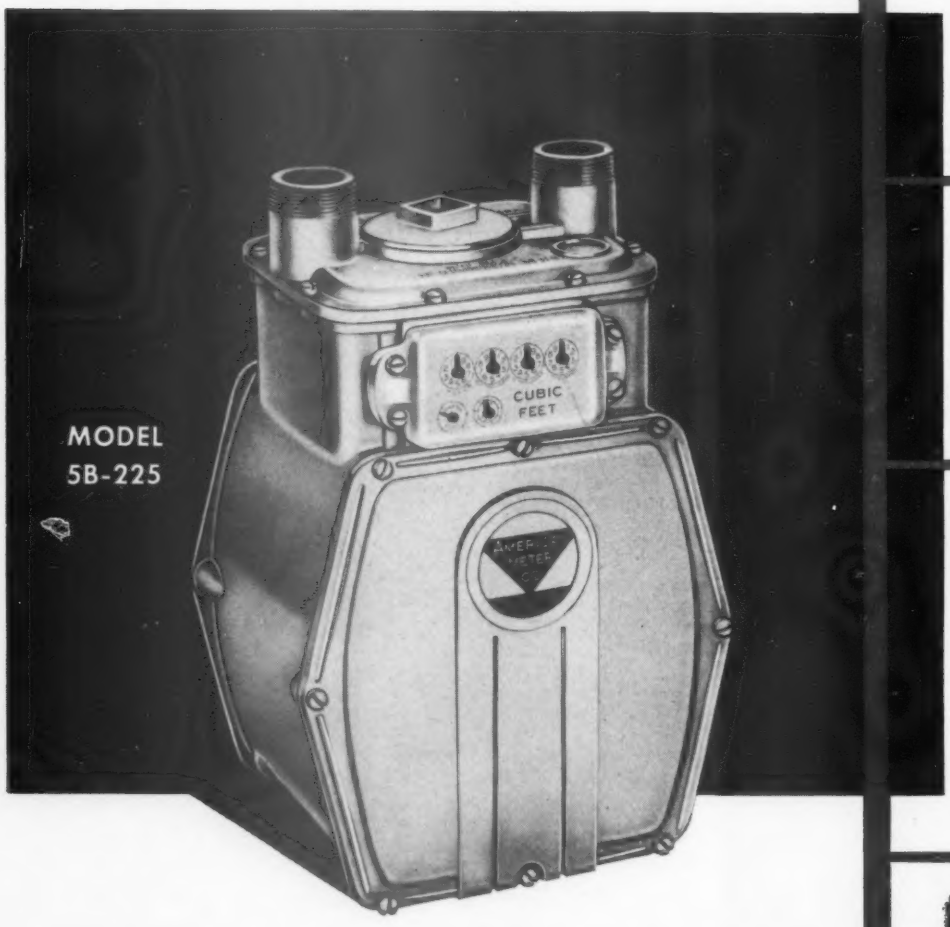
TODAY ... CASH-IN ON YOUR SERVEL ADVERTISING-MERCHANDISING PROGRAM! CALL IN YOUR SERVEL DISTRIBUTOR NOW!

Servel

The name to watch for great advances in
REFRIGERATION and AIR CONDITIONING

Servel Inc., Dept. AG7, Evansville 20, Indiana • In Canada, Servel (Canada) Ltd., 548 King St. W., Toronto, Ontario

NEW American® Aluminumcase Meters



American's new Model 5B-225 Aluminumcase Meter has ample capacity for household space heating loads. Weighing under 15 pounds, this new meter features a one-piece precision-machined aluminum alloy body . . . insuring complete parts interchangeability and high resistance to impact damage. Model 5B-225 incorporates all of the excellent characteristics of American Ironcase Meters, including self-lubricating porous bronze bearings to provide prolonged accuracy and minimum wear. New grommet-type bushings in the axle and flag rod stuffing boxes provide dependable, positive leak protection with minimum friction.

Write today for full details on the NEW 5B-225 Aluminumcase Meter by American—your assurance of low-cost, sustained accuracy in metering.

NEW Extra Value

—priced the same as the American 5B Ironcase Meter.

NEW High Capacity

—225 cubic feet per hour of 0.6 specific gravity gas at ½-inch water column differential. Working pressure 5 psi.

NEW Light Weight

—saves in shipping, handling and setting. Pressure die-cast aluminum alloy. Shipping weight less than 15 lbs.

NEW Index Box

—easy meter reading because clear, high impact strength molded all-plastic design gives full index visibility.

NEW Distinctive Design

—insures customer acceptance in either indoor or outdoor settings . . . styled by prominent industrial designer.

AMERICAN METER COMPANY

GENERAL SALES OFFICE: 1513 Race Street, Philadelphia · Albany · Alhambra · Atlanta · Baltimore · Birmingham · Boston · Chicago · Dallas · Denver · Erie · Houston · Kansas City · Los Angeles · Minneapolis · New York · Omaha · Pittsburgh · San Francisco · Seattle · Tulsa

IN CANADA: Canadian Meter Company, Limited, Hamilton · Edmonton · Calgary

Editorial:

The Best Decision?

THE facts, as they were laid before the Federal Power Commission during the past 2 years, gave the Commissioners little choice, as they indicated in their unanimous decision to grant Pacific Northwest Pipeline Corporation a certificate to construct and operate facilities for transporting natural gas from New Mexico to the only untouched major market, Washington-Oregon.

A clear question was raised by Chairman Jerome K. Kuykendall in his point of dissent, suggesting the economic advantages if a delay of a year would show official Canadian approval to export southern Alberta gas on a basis that assures the required long-term dependability. He asserted the record indicates the entire Pacific Northwest area could be better and more cheaply served by southern Alberta gas. Chairman Kuykendall's vote, however, favoring the New Mexico pipeline, might well mean that he was reluctant, in the public interest, to take the risk.

The subsequent action by Westcoast Transmission Company, protesting the FPC decision, seems to mean only that the company is seeking its final day in court. Precedent is all against having a unanimous FPC decision overruled.

Much more significant, at this time, is the substantial reason to believe that the insurance company aligned with Pacific Northwest Pipeline will give thoroughgoing scrutiny, before advancing funds, to such highly pertinent considerations as the overall market demand, delivered price of gas and the thin spread to the competitive pricing of other fuels. Indeed, the economics of the project have given it an element of uncertainty.

With no fear that any substantial reserves of gas in the United States will go begging, we cannot pass the subject of gas for the Northwest without a note of regret that the superior economics indicated for Canadian gas could not be brought to bear in our mutual interests. Our Canadian cousins, for whom we have long and lasting affection, have had more-than-adequate time to study the situation and resolve the export difficulties without prejudice to the supplies for their own industries and homes. Available gas that is not brought to market is not truly conserved.

This Above All:

ISOLATED cases may well be a questionable basis for viewing-with-alarm. Yes, but . . . *but,* when those isolated cases have far-reaching and serious implications for the entire gas industry and—certainly—for the equipment and appliance manufacturers, their distributors and their dealers, it seems to be quite another matter.

More and more startling examples have come to light of new residential developments that have no gas mains, no gas service, whatsoever. Lest there be doubt as to the startling nature of these examples—2 Eastern developments, alone, account for more than 23,000 units; others build the national total to a depressing number of thousands. The 2 Eastern developments are well-within the economic service areas of their respective gas utilities.

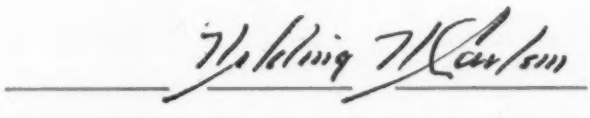
It does not take much time or much thought to come to the conclusion that the effects of all these examples are felt far beyond the gas companies directly concerned. Every gas company is affected! Every utility-equipment manufacturer and supplier is affected! Every gas appliance manufacturer is affected! Every appliance distributor and every dealer is affected. And . . . all of them are affected seriously.

Now, it is too late to do anything about it. *Too late!* In the 2 Eastern developments, there is not a single prospect for gas appliance sales . . . 23,000 non-prospects for gas ranges, water heaters, heating equipment, air conditioning equipment, incinerators, clothes dryers and refrigerators.

Another non-gas residential development within a gas service area was explained, incredibly, by a gas company executive: "We didn't know about it."

It is no exaggeration to state categorically that every residential development, within an economic utility area, that does not have gas service available is promotion for the competition—supplied free by the gas industry. The values of that promotion are obvious and incalculably high.

That this is a consideration and problem for the entire gas industry . . . another gas industry problem . . . is equally obvious. To suggest the solution —that would be thoroughly inane.



FPC Regulation of Producers Set In Supreme Court Decision

Effects of Phillips ruling not clear

THE long controversy over whether or not the Natural Gas Act gives the Federal Power Commission jurisdiction to regulate prices charged by the independent producers and gatherers was finally settled by the Supreme Court of the United States in its recent decision in the Phillips Petroleum Company case. The high court, in a 5-to-3 holding, ruled that Section 1(b) of the Act does give FPC authority to regulate Phillips' prices and those of other independent producers and gatherers of natural gas.

Thus has ended the legal phase of a struggle that has been waxing forth and back for 14 years, with conflicting claims, conflicting decisions and attempted legislation, leaving the industry in constant confusion, never knowing whether it was subject to regulation or not. While the legal uncertainty is over, there are indications that a new effort on the legislative front will be made to have Congress amend the Act to definitely exclude independent producers and gatherers from Federal regulation. But a long struggle lies ahead there, too, with election results, presidential attitudes and movements of political forces all in the picture. And until such Congressional amendment is passed and approved, the industry must take stock of the new holding and see where it stands.

Critical industry comments

Industry comment on the Supreme Court ruling followed within a few days of the high tribunal's holding in early June and was almost uniformly critical. Some officials of producing companies called the ruling bad for both the industry and consumers, depressing to industry morale, and highly disappointing.

K. S. Adams, chairman of the Phillips Company, in announcing that his attorneys would petition the Supreme Court for a rehearing, said the Court's construction would make the Natural Gas Act "intolerable and unworkable."

Some of the spokesmen for the producers and gatherers indicated the primary effect on them might be a cautious restriction of future moves. The darkest views indicated that the Court's ruling might curtail production and cause some of the major producers to be reluctant in making new contracts for the sale of gas in interstate commerce.

by Joseph E. Finley

THE NATURAL GAS PRODUCER'S POSITION in the gas industry's compliance with Federal regulation went into a state of doubt with the enactment of the Natural Gas Act in 1938 and stayed there until the Supreme Court decided recently upon the highly-controversial case involving Phillips Petroleum Co. . . . Joseph E. Finley, who writes about that decision on this page, is a Washington lawyer, with special interest in natural gas legal problems.

However, this view has been disputed by one former FPC official, who, while not necessarily approving of Federal regulation, doubted that the decision would have any appreciable effect on production and even on prices.

Now, however, the producing and gathering side of the industry must always take FPC into consideration. The current Commission has already opposed regulation in the Phillips case but now has been told it must do what it had earlier believed it should not do. FPC now will have to devise price-setting arrangements, but unless the Commission were to adopt stringent regulations, the industry still has an opportunity to obtain the prices it feels it should have. However, there is no doubt that regulation, of itself, exerts a heavy hand and the time, cost and delay in the regulatory process might have a deterring effect on the producing side of the industry.

FPC plans regulation

FPC apparently is moving ahead with plans for regulation, but now the question arises—should the industry view this as a temporary annoyance until Congressional change is obtained, or should gas producers reconcile themselves to the facts-of-regulatory-life and prepare to live with the FPC?

Now that regulation is actually here, other segments of the industry have been considering its effects upon them. Many of the pipeline companies, already under regulation, also engage in production and gathering and will have a new part of their operations within regulation. Some attorneys for pipeline companies engaged solely in transmission have viewed the Phillips decision as not affecting them to any great degree other than the general extension of Federal regulation into their industry.

With prices fixed at the distribution end of the natural gas process, the utilities and the consumer will not likely feel any immediate reaction to the new assumption of Federal regulatory jurisdiction. The regulatory process itself is a slow one and even assuming a tight FPC rein on prices of producers, the back-up to the consumer will be slow and conditions might readily change on all fronts before any marked price reduction would occur. On the other hand, some realistic industry members, all along the line, feel that field prices have been quite fair and reasonable and that FPC approval to continue them will follow and that about the only effect of the Supreme Court ruling will be the exercise of jumping through the regulatory hoop.

This brings up a further realistic question—what price regulation? In the Supreme Court's majority opinion, Justice Sherman Minton said that "Protection of consumers against exploitation at the hands of natural gas companies was the primary aim of the Natural Gas Act." Without questioning this statement, the analytic observer might ask—But does regulation *per se* in a competitive industry actually protect the consumer? Will not other competitive forces do the job better or just as well, without regulation?

A former member of the Federal Power Commission told this writer of an electric utility executive who prided himself on charging consumers lower prices in his state, where there was no regulatory commission, than in the neighboring state where there was regulation. When asked how he did it, the executive laughingly replied, "I've got no commission to pass the buck to." In that man's state, the consumer benefitted without regulation. While this presentation is not meant to be a brief against regulation, this writer does believe that searching questions should be asked, and the whole regulatory picture might well be examined and reevaluated from many aspects.

The Supreme Court decision itself, in the majority opinion by Justice Minton, was the last legal round to settle a question that has hovered over the industry almost from the time the Natural Gas Act was passed in 1938. A vigorous dissent was written by Justice Tom C. Clark, joined by Justice Harold H. Burton, while Justice William O. Douglas filed a separate dissent.

Form of majority opinion

For the majority, Minton compounded a mixture of the language of Section 1(b) of the statute, the legislative history when Congress passed the Natural Gas Act and

Turn to page 34—PHILLIPS CASE

Northern Natural Launches National Ads Promoting Area

JUNE marked the entrance into a new phase of advertising for Northern Natural Gas Company when, beginning with the June 7 issue of *Time* magazine, the company launched a national campaign primarily designed to attract industry into Northern's market area. This is the area which the utility terms the Northern Plains area and which encompasses Minnesota, Iowa, the Dakotas, Nebraska and western Wisconsin.

Although this was the company's first venture into area development advertising in a national, mass-circulation magazine, it was not the company's first experience in area development work. Northern's president, John F. Merriam, has for many years been keenly aware of the growing need for a concentrated area development program in the Northern Plains area.

John F. Merriam

For several years the utility has been working with area development groups, chambers of commerce, industrial development organizations and other similar groups in its market area. In 1952, Northern's area development activities were shaped into a more concrete form by the creation and staffing of a full-time area development department.

Mr. Merriam's sincere interest in this area and industrial development was further manifested last year when he accepted the presidency of Omaha Industrial Foundation, a group of civic leaders dedicated to bringing more industry into the vicinity of Omaha.

Northern's area development department, and in particular the national advertising program just launched, has five key objectives:

1. The creation of a continually expanding sales market for Northern Natural.
2. The development of economic prosperity and stability in the Northern Plains area.
3. Maintaining and encouraging an increase in population in the area through the development of employment oportunities.
4. Establishing and maintaining the good will of its consumers and the general public.
5. Maintaining good public relations for the entire gas industry.

Principal media

The principal media to be used in Northern's national advertising program are *Time* and *Business Week*, two magazines which reach a majority of the executives of the nation's large industrial firms.

The first advertisement, in the June 7 issue of *Time*, highlighted the wealth that exists in the Northern Plains area. The lead of this ad stated that "money grows on corn and wheat stalks in the Northern Plains. For the wealth of this green and golden land is based on agriculture.

"Here, where hybrid corn was born, agriculture and industry transform this greatest American crop into pork and beef and laundry starch . . . cereals and chemicals . . . milk and liquor."

Other advertisements in this series will be geared to such topics as the tremendous water resources within easy reach of industry in the Northern Plains area, the ready supply of highly desirable workers, and the availability of natural gas service—and its versatility—for industries locating in the Northern Plains.

Many other assets of the area are interwoven into these advertisements. Typical is a paragraph which points out that "A dozen railroads spread over the plains to the four borders of the nation. A major airline originates here and touches wings with the round-the-world system. The nation's second busiest port edges the Great Lakes."

The schedule for the timing of Northern's current series of area development advertisements reads: They will appear in *Time* on June 7, July 26, September 13, and November 1. Similar advertisements will be in *Business Week* on June 26, August 14, October 2, and November 29.

To gain the maximum public relations

Turn to page 32—NORTHERN NATURAL

BROAD VIEWPOINT is considered as Northern Natural highspots other factors in industry location. The heads of these 3 ads emphasize the water, labor and wealth that is available in the 6-state area. All ads in the series include appropriate emphasis on natural gas.

FUEL is the emphasis in this ad, typical in style of the series prepared by Northern Natural Gas Co. to attract new industry.

Process for Economic Solution of Peak and Standby Problems

by Virgil Stark
President
North American Utility & Construction Corp.

WITH the important problem of peakload facing the gas industry, especially when natural gas is distributed, a substitute for natural gas is needed not only for the heavy Winter loads, but also as standby in case of supply failures.

The maximum Winter day load may be 5 times higher than the minimum Summer day load and double the average day load during the year. In the desire to curtail the heaviest load requirements, the natural gas transmission companies have included in the natural gas rates a "demand charge" in addition to the "commodity charge." The demand charge is based on the maximum day requirement for natural gas. This demand charge increases the cost of natural gas considerably, for heavy peak days. It is, therefore, of economic interest to cover part of the peakload with gas made from other fuels.

If no substitute gas would be provided for the heaviest peak days, the cost of the natural gas for such days only would amount, according to J. Carroll, up to $15.60 per Mcf, that is approximately 30 times the average cost of natural gas.

Certain contracts for natural gas provide penalties when the demand load is exceeded; for instance, increase of commodity charge from 30¢/Mcf to more than $1.00/Mcf, if load exceeds 4% over the contracted demand. Some contracts provide also penalties for minimum load; for instance, that the monthly bill shall be at least equal to the monthly quota of the demand charge. If no peakload shaving is provided with another fuel, this penalty may increase considerably the cost of natural gas not only for peakload days, but also for minimum loads.

When oil gas is considered as a substitute gas for peakloads and standby, inconveniences result from the reduced number of days of operation during the year. The oil gas plant may operate only a few months per year or even a few days per year (in case of standby). The depreciation on capital investment has to be made on a reduced output, which makes the price per Mcf produced very high. Instead of using low-cost heavy oil as the fuel, a higher cost gas oil is used as more convenient for short operations, thereby avoiding such considerations as heating. The main problem is to keep the specialized personnel available and the equipment in good condition, ready for use.

As oil gas has a higher gravity (approx. 0.9) than natural gas (approx. 0.6), it may be necessary to increase the heat content of oil gas by approximately 10% (to more than 1000 Btu/cf) to provide a substitute gas of similar burning characteristics to natural gas.

For propane-air (gravity 1.2), it may be necessary for the same reason to increase the heat content of the substitute gas 25-to-40% (1,250-1,400 Btu/cf). The increased heat content of the substitute gas represents generally a loss for the gas company, unless the utility commission allows an extra charge to the consumer. Propane is relatively scarce in Winter and is a costly fuel (for the East, 2-3 times the average cost of natural gas based on heat content). The capital investment is lower than for oil gas, but large storage may be required to store lower-cost, out-of-season LP gas.

Both oil gas and propane have organic sulphur which may be harmful in certain industries using gas and it is detrimental to pipelines. Oil gas is free of H_2S, but not of organic sulphur which may represent in a proportion of 30 grains/100 cf. Propane is odorized with organic sulphur (methylmercaptan) at the refinery. Oil gas has, in addition, the inconvenience of the condensables, that is higher hydrocarbons (C_4-C_8) which may condense in the distribution lines during cold months.

Both oil gas and propane are expensive substitutes for peakloads and do not solve 100% the problem of standby and interchangeable gas.

A process has been developed to produce gas from heavy oil only, in a plant operated continuously, all year, at full rated capacity. The higher hydrocarbons will be extracted from oil gas. The gas after extraction will be enriched to 1,000 Btu/cf with various parts of the hydrocarbons separated. During low loads, a major part of the gas after extraction will be used for plant requirements of heat and power. During higher loads, all the gas after extraction will be used for producing substitute gas; other fuels will cover the plant requirements.

The output in substitute gas, as shown hereafter, may vary greatly from 100% to about 335%, even though the oil gas will be produced continuously at the same rated capacity. The flexibility in substitute gas produced can be increased from 100% to about 670% by operating, for short periods, the oil gas and extraction plants at half of the rated capacity.

A more elaborate extraction, could be considered in which CH_4 would be separated and a cut with 88% CH_4 obtained, the separation of ethylene.

A simplified solution is presented hereafter, with a limited extraction involving less capital investment. This solution considers as by-products for sale, only two cuts (C_6-C_8 and C_3-C_4) and the separation of C_3 (propylene), from the C_3-C_4 cut. The 3 by-products considered for sale can be stored and shipped in conventional tanks, and are in increasing demand.

In this way a gas company will not become part of the chemical industry, but will solve its problems in an economical way, obtaining also a substantial reduction in the cost of gas produced.

Extraction and separation

The extraction of higher hydrocarbons from oil gas can be obtained by different methods, with various results, depending on the project considered.

A typical example for such extraction is shown below. The oil gas is purified, compressed and then refrigerated at low temperatures. The hydrocarbons are extracted and then separated. Part of the extracted hydrocarbons are used for the refrigeration cycle.

Not only is the oil gas purified of H_2S, but all the organic sulphur is extracted in the process of refrigerating compressed gas. The extracted cuts can be purified of organic sulphur, if desired, but the gas after extraction will be free both of condensibles and organic sulphur.

In a consideration hereafter of a typical extraction, taking as basis the operation with 1 Mcf of oil gas of 1,000 Btu/cf, Table 1 shows the approximate analysis of each cut, the heat value represented by each cut (in thousand Btu/Mcf) and its heat content and specific gravity.

The results show that the gas after extraction (R) represents 598,000 Btu or 59.8% of the heat content in 1 Mcf of oil gas and has 736 Btu/cf and 0.58 gravity. All the hydrocarbons extracted will represent 402,000 Btu per Mcf of oil gas and will be used either to enrich the gas after extraction to obtain a substitute gas of 1,000 Btu/cf or will remain available as by-products for sale.

The plant requirements (P) will be approximately as follows (expressed in Btu) per Mcf of oil gas (1,000,000 Btu):

Pa—*Heat*	*Btu/Mcf*
Pa-1—Heating of oil gas generator, 1.5 gallons of oil or tar per Mcf	210,000
Pa-2—Steam for making oil gas .	30,000
Pa-3—Heat for purification, separation, tar dehydration ..	35,000
Pa—Total heat Btu/Mcf	275,000
Pb—*Power*	
Pb-1—Compression for extraction and refrigeration (approximately 7.5 hp/Mcf)	70,000
Pb-2—Air blower for oil gas generator and various other	

uses 27,000
(If waste heat boiler is available for recuperation of heating combustion gas then Pb-2 could be covered by the steam produced and the 27,000 Btu/Mcf can be deducted.)

Pb—Total power Btu/Mcf 97,000
Total plant requirements (P), for heat (Pa) and power (Pb), per Mcf of oil gas in Btu/Mcf 372,000
P represent 37.2% of the heat content in oil gas.

Plant requirements (P) would be covered for lower load periods by gas R (out of 598,000 Btu/Mcf) and for heavier loads for Pa by tar (by-product) or heavy oil, and Pb by either diesel oil (in dual-fuel engines or separate engines) or by tar or oil (in boilers producing steam for steam turbines) or by electricity, depending on the location. When gas is used for Pb, it can either drive gas engines or be burned in boilers to produce steam for steam turbines.

This is an example of different load periods for the production of substitute gas (S) of 1000 Btu/cf.

Period A From the gas R produced (598,000 Btu/Mcf), 372,000 Btu/Mcf will be used for plant requirements (P).

The balance of gas R (226,000 Btu/Mcf) will be enriched (from 736 Btu/cf to 1000 Btu/cf) with all of C_2 cut available (109,000 Btu/cf). The total substitute gas (S) will be therefore 335,000 Btu/cf (33.5% of heat value in oil gas processed). Gas S will have 1,000 Btu/cf, 0.67 gravity and will contain about 16% H_2.

Period A_1 (lowest load in Summer; for example, one month). The plant can either be operated at ½ load continuously or it can be closed, for instance, for 2-to-4 weeks per year for repairs, maintenance and vacations.

In case of 2 weeks/year shutdown, the production of substitute gas will be reduced (average for one month) to 167,500 Btu/Mcf.

Period B (begins when load exceeds the contractual demand load of natural gas plus production of gas S during period A).

Gas R used for plant heat requirements (Pa) during period A (275,000 Btu/Mcf) will be used to increase the production of gas S. Either tar (by-product) or heavy oil can be used to cover Pa. For Pb, part of gas R will be used, while the other part (275,000 Btu/Mcf) will be enriched with part of C_4 cut, that is, 38,000 Btu/Mcf (out of 63,000 Btu/Mcf). The additional gas S will represent 313,000 Btu/Mcf. The total substitute gas will be 648,000 Btu/Mcf (64.8% of heat value of oil gas processed), gravity 0.69.

Period C (begins when load is heavier than demand load in natural gas plus gas S in period B). Gas R used in periods A and B for plant power requirements (Pb) 97,000 Btu/Mcf will be enriched with part of C_4 cut (13,000 Btu/Mcf) to produce additional gas S of 110,000 Btu/Mcf.

Table 2 considers the economics of the use of diesel oil (0.67 gal/Mcf) at 12¢/gal to cover plant power requirements (Pb).

Total gas S will represent 758,000 Btu/Mcf (75.8% of heat value in oil gas) gravity 0.7.

Period D (heavier loads than in period C). The available C_4 cut (12,000 Btu/Mcf) and all of the C_3 cut (113,000 Btu/Mcf) produced during current daily operation can be gradually used to obtain as much as 125,000 Btu/Mcf additional gas S to a total of 883,000 Btu/Mcf.

The C_3 and C_4 cuts can be diluted with air, however the gravity of gas S will be higher.

Reforming with steam is considered in a catalytic generator of C_3 and C_4. The reformed gas of approximately 340 Btu/cf and approximately 0.37 gravity will be enriched with C_3, C_4 to obtain gas S of 1,000 Btu/cf and 0.72 gravity (the mixture is aproximately 72% natural gas, 28% C_3, C_4).

Tar or heavy oil can be used to heat the generator such as the concentric catalytic generator. The tar consumption will represent approximately 10,000 Btu/Mcf. Reforming and tar consumptions are shown in Table 2.

Period E (very heavy peakloads, a few days per year). For the heaviest loads which may represent less than a week per year, the following alternatives can be used:

a—Additional gas S can be produced by using C_3 and C_4 from storage, either in the form of C_3 or C_4 with air, or reformed C_3, C_4 enriched with C_3, C_4. The latter is considered in Table 2.

In another case:

E_2—that is, using 2 current days' production of C_4 only, taken from storage. The additional gas S will represent $2 \times 63{,}000 = 126{,}000$ Btu/Mcf. Total gas S 1,009,000 Btu/Mcf.

E_4—Using 4 days of storage reserve of C_4 only, that is, 252,000 Btu/Mcf. Total gas S will be 1,135,000 Btu/Mcf.

b—Oil gas can be used from reserve capacity. Assuming that the oil gas generator reserve represents 50% of operating capacity (1/3 of total capacity), the addition in gas S would represent 500,000 Btu/Mcf, that is a total (including period D) of 1,383,000 Btu/Mcf of oil gas normal operating capacity (883,000 of period D plus 500,000 of extra oil gas).

Table 2 shows the situation during each period, with such considerations as capacities, composition and by-products.

The substitute gas S produced may vary from 335,000 Btu/Mcf-to-1,383,000 Btu/Mcf, operating the oil gas plant during 365 days a year at full capacity (1,000,000 Btu). If for a short period the plant is operated at one-half capacity, the substitute gas can be reduced to 167,500 Btu. The flexibility of the plant can be as high as 6.7 times the minimum load.

The substitute gas will have a gravity from 0.68-to-0.72 and will be a "better substitute" than oil gas (0.9) or propane air (1.2).

The cost of gas production will depend on the location and size of the plant.

As an example, a plant located in New England has an oil gas capacity of approximately 10,000 Mcf/day.

These are the estimates per Mcf of oil gas produced (1000 Btu/cf):

1. Fuel for making gas—heavy oil (Bunker C, residuum or #6). Consumption is approximately 11 gal/per Mcf. Cost is about 6¢/gal .....66¢/Mcf
2. Other costs to produce oil gas, labor, maintenance, purification, etc., in addition to fuel .....8¢/Mcf

Table 1—APPROXIMATE ANALYSIS—(Percent by volume)

	Gas after extraction	Cuts			
	R	C_2	C_3	C_4	C_6
H_2	23.7				
CO	3.7				
O_2	0.6				
N_2	17.2				
CH_4	38.2	6			
C_2H_4	13.7	65		2	
C_2H_6	2.0	26.7		—	
C_3H_6	0.9	2.1	91	8	
C_3H_8	—	0.2	6	—	
C_4H_6	—	—	1.8	53.5	1.2
C_4H_8	—	—	—	31.5	0.7
C_5H_{12}	—	—	—	5.5	7.2
C_6H_{12}	—	—	—	—	2.4
C_6H_6	—	—	—	—	64.6
C_7H_8	—	—	—	—	17.
C_8H_{10}	—	—	—	—	6.8
Heat cont. Btu/cf	736	1,570	2,417	2,912	3,993
Sp. gr., vapor (air: 1)	0.58	0.88	1.46	1.89	4.55
MBtu/Mcf, oil gas, available in each cut	598	109	113	63	117

Plant requirements for heat and power are covered either by gas or other fuels indicated in Table 2.

3. Extraction, compression, refrigeration, separation, purification may require 4 men per shift. Addition to fuel above .....3¢/Mcf
4. Depreciation for extraction, compression, separation, etc., will depend greatly on the size of the plant and the number of years considered. For a plant of 10,000 Mcf/d .....8¢/Mcf

Total cost of oil gas .....85¢/Mcf

Oil gas generators may be available for peakload or standby or can be changed over from carburetted water gas sets. If no oil gas generators are available, the above cost of oil gas should be increased by 6 cents/Mcf for depreciation of the oil gas equipment, based on continuous operation and 1/3 reserve.

Byproducts

This study considers making available for sale only 3 byproducts (C-3, C-4, C-6). The amounts extracted in heat value, lbs per Mcf, market value in New England are shown in Table 2.

C-3—propylene (C-3 97%), has an important market for detergents, antifreeze, rayon, plastics, solvents, resins, etc. A sales price of 5¢/lb is considered here; below the market price.

C-4, as LP gas, has a known market. The price is 12¢/gal; this study considers 9¢/gal or 2¢/lb. However, this cut should have a much higher value if sold to chemical industry as it contains mostly butylene and butadeine; approximately 12¢/lb used for synthetic rubber.

C-6—benzol is scarce and partially imported from Europe. It can be separated in benzene (99.5%), toluene (95%) and xylene (95%). The market value is approximately 7¢/lb; credit here is only 5¢/lb, considering cost of rectification and to be lower than the market price.

All above products can be stored and shipped in tanks either for propane specifications (LP gas), or gasoline (benzol).

Table 2 shows the credit for byproducts, the cost of oil gas after deduction of this credit and the cost of substitute gas *S*, considering the production of S in percentage of the oil gas processed.

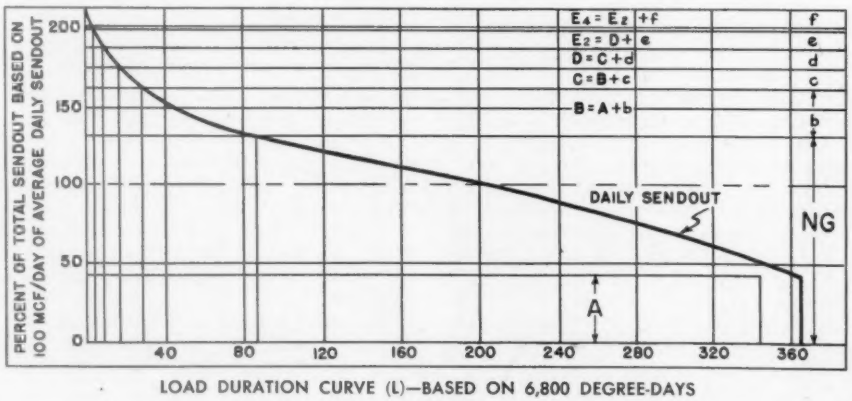
It follows that if the plant would be operated continuously, as in period A, the cost of gas would be only 14.2 cents/Mcf. Even if used as in period B, the cost would be 29.6¢/Mcf. That is about one-half the cost of natural gas in New England. If ethylene (9.7 lbs/Mcf) would be separated for sale (market value 3¢/lb), instead of being used as gas (at less than ½¢/lb), the additional credit would be approximately 20¢/Mcf of oil gas.

Load duration

The load depends greatly on the number of degree-days. In this study, a basis is the load duration curve (L), published by Knoy and Turnan, for 6,800 DD per year and maximum 65° DD for the coldest day. However, 100 has been taken as the average day sendout during the year (total yearly sendout divided by 365). This curve has been related to this average.

Table 2—PRODUCTION BY PERIOD

PER MCF OIL GAS	A	B	C	D	E_2	E_4
Gas S, substitute, 1,000 Btu/cf, production in MBtu/Mcf	335	643	758	883	1009	1135
Capacity in % of period A	100	192	215	263	300	338
Sp. gr. of gas S (air = 1)	0.67	0.69	0.7	0.71	0.715	0.72
Composition of gas S, in MBtu/Mcf						
Gas R	226	501	598	598	598	598
C–2 for enriching R	109	109	109	109	109	109
C–4 (produced)	—	38	51	63	63	63
C–4 (from storage)	—	—	—	—	126	252
C–3 produced	—	—	—	113	113	113
Oil gas	—	—	—	—	—	—
Total	335	648	758	883	1009	1135
Plant requirements, MBtu/Mcf						
Pa—Heat Gas R	273	—	—	—	—	—
Tar or heavy oil (incl. heating for reforming)	—	273	281	291	311	331
Pb—Power (compression and blower for generator)						
Gas R	97	97	—	—	—	—
Diesel oil (for electr. or tar in boilers)	—	—	97	97	97	97
BY-PRODUCTS IN MBtu/Mcf						
C–3	113	113	113	—	—	—
C–4	63	25	12	—	—126	—252
C–6	117	117	117	117	117	117
Tar	375	102	94	84	64	44
Diesel oil for power, lbs/Mcf	—	—	—97	—97	—97	—97
C–3	5.35	5.35	5.35	—	—	—
C–4	3	1.2	0.57	—	—6	—12
C–6	6.5	6.5	6.5	6.5	6.5	6.5
Tar, gal/Mcf	2.5	0.67	0.62	0.56	0.42	0.27
Diesel oil, gal/Mcf	—	—	—0.67	—0.67	—0.67	—0.67
Credits for by-products ¢/Mcf						
C–3, 5¢/lb propylene	26.75	26.75	26.75	—	—	—
C–4, 2¢/lb LP gas	6	2.4	1.14	—	—12	—24
C–6, 5¢/lb	32.5	32.5	32.5	32.5	32.5	32.5
Tar, 6¢/gal	15	4.2	3.7	3.36	2.52	1.74
Diesel oil, 12¢/gal	—	—	—8.05	—8.05	—8.05	—8.05
Total credits, ¢/Mcf of oil gas	80.25	65.85	56.04	27.81	14.97	2.19
Cost of oil gas ¢/Mcf 85¢/Mcf, less credits	4.75	19.15	28.96	57.19	70.03	82.81
Cost of gas S ¢/Mcf, capacities as above	14.2	29.6	38.1	64.8	70	73



LOAD DURATION CURVE (L)—BASED ON 6,800 DEGREE-DAYS

The maximum daily peakload is 212. A typical plant in New England reported that it covers such a load by 135 in natural gas, and 77 in gas made from other fuels, such as oil gas.

The application of this process to production of substitute gas raises the problem of what capacity should be chosen and to determine what part of the load should be covered by natural gas and what part by gas S, considering the heaviest peak and minimum requirements. This may vary from case to case.

As an example, the following is selected as compared with 100 for the average day load and as shown in curve L.

Demand load for natural gas,—90, instead of 135; load for period A is selected as 42. Load for oil gas—125.

Turn to page 37—STARK

Electrical effects on pipelines

Current PIPE PROTECTION Topic

WHERE it is necessary to construct a pipeline along a high tension line, and this should be held to a minimum, 2 protective measures should be taken: Personnel; Insulated Joints.

That is the opinion of Joseph P. Daratt, Niagara Mohawk Power Corp., expressed at American Gas Association's distribution, motor vehicles and corrosion conference, Montreal.

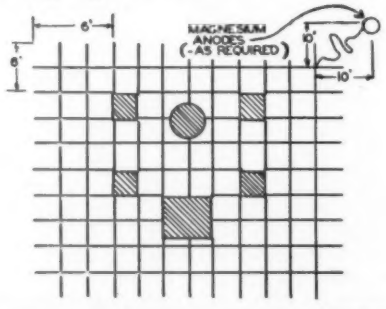
Personal safety should be the primary consideration. A ground grid in the working area of valves and associated accessories is a feasible method of keeping personnel at the same potential as the pipeline. The accompanying chart shows such a grid.

Protection of insulated joints against high voltage surges is still open for improvement. Niagara Mohawk is installing a spark or spill type arrester with three gaps; one gap across the insulated joint, and one from each side of the joint to ground: the latter gaps are smaller than the gap across the joint.

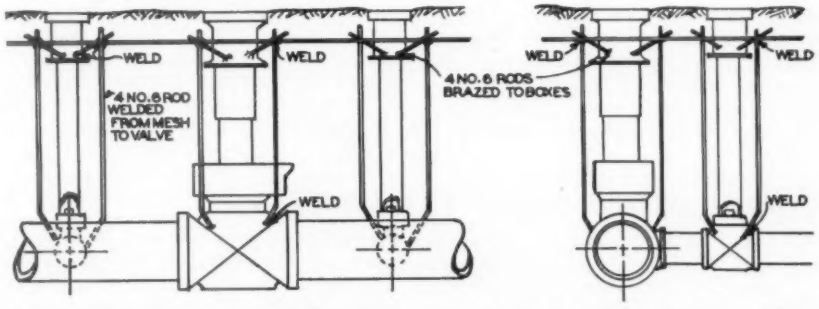
Available arresters have one common defect, Mr. Daratt stated. They require constant vigilance and maintenance to assure working order when needed and, in general, the discharge at too high a voltage.

Spacing of insulated joints on coated pipelines depends upon type of soil, soil resistivity, pH values and other physical factors. Past experience has taught that where abrupt changes take place between soils of low resistivity and soils of high resistivity, corrosion is most active.

Insulated flange type joints are in general use on high pressure gas lines mainly because of their mechanical strength. They are, however, subject to deterioration in insulating value from high voltage surges, mill scale bridging across the insulating material in the joint, internal moisture, bolt sleeve fracture and current leakage around the flange due to break-down of external coating.



Typical plan for ground potential grid and valve box, using 6 x 6 x 6/6 reinforcing mesh. The total grid is made of 2 or more lengths of roll mesh, welded with a minimum of 6" overlap. The mesh is laid 6" below grade. It is joined to the main and bypass valve boxes by 4 No. 6 rods spaced and brazed equally around each box, as shown in the arrangement below. The main and bypass valves are joined to the mesh by 4 other No. 6 rods, also equally spaced. All bare metallic parts are coated with Bitumastic No. 50 or equal.



Experience indicates that one flange at a valve for an insulated joint is not satisfactory because, in larger size valves at least, it requires field assembly which is always problematical as to quality and it also involves difficulties in applying the coating. Separate sets of flanges installed underground can be more easily and better protected against external moisture. A flange type insulated joint above ground, where possible, is desirable.

A policy of shop-fabrication for insulating joints will pay off in joint quality. Nipples at least 3' long should be welded to flanges before assembly, considerable care taken in drawing up the bolts uniformly and applying initial coating.

Problems of mill scale bridging across the flanges or moisture setting up a leakage path can be mitigated by two methods. Coat the flange joint internally, after assembly, with liquid neoprene; the other is the use of an insulating gasket with smaller internal diameter than the pipe.

Niagara Mohawk's specifications call for above-ground installation in a vertical position wherever possible, allowing mill scale and moisture to drop past the flange.

An experiment now in progress uses a flanged spool piece coated with a rubber compound, internally and externally, as well as on the face of the flanges, appears to offer a decided improvement over the conventional insulated flange joint. Field testing is not yet completed.

For technical details on this presentation, communicate with American Gas Association, 420 Lexington Ave., New York 17.

Basementless service design

Current GAS METERING Topic

GOOD practices in design of gas services were exemplified by B. Hunt, Illinois Power Co., in a tentative report on service design for basementless buildings at the American Gas Association distribution, motor vehicles and corrosion conference at Montreal.

In large sections of the country basementless type of construction has become such a proportion of new building as to create a problem with wide interest as to method of supplying gas service.

The accompanying illustrations are examples of actual design in current successful operation. That there has to be a number of different designs on account of varied building designs is apparent, but there also have to be variations in design to accommodate differences in system pressure and type of gas distributed.

Those who may hold an interest in this problem will compare their own designs with these displayed and will arrive at their own conclusion by: (1) finding that their design compares favorably with the ones selected, (2) believing that their design is much better, (3) adopting in whole or in part these so-called good designs used by contemporaries.

For the purpose of this study, only that portion of service adjacent to the building and entrance will be considered.

Where climatic conditions permit, when gas is dry and not adversely affected by temperature, and where otherwise possible, it is wide-spread practice to locate the meter or regulator exterior to the building.

Where service must not be subjected to low temperatures on account of condensable fractions in the gas, then service must be underground or otherwise protected and the meter or regulator must be in an inside or protected location.

Many company service policies state:

Under no circumstances shall any portion of gas service from main to meter be installed in any unexcavated ground under, beneath, or below any building, or in any crawl space, etc.

The increase in basementless homes, many designed without provision for a meter on an outside wall, but with provision in a utility room near the building center, presents a rather difficult design problem to one having such a policy.

Several companies have met this problem successfully by designing a service sleeve for the under-building portion and sealing this sleeve where escape of gas would be potentially dangerous and venting the sleeve in a safe manner.

Figure 1 indicates design of service entrance for one-floor basementless home having no rooms above the first floor, with utility room near building center and no outside wall for meter setting. This design is to be used only where temperature or

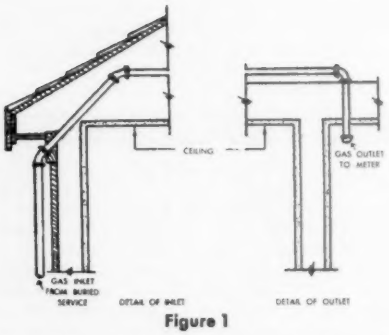


Figure 1

gas characteristics would not adversely affect service. Meter may be set inside building if service regulator is not required, or if regulator is exterior-installed.

Meter and regulator may be installed exterior to building. All inside piping to carry no more than utilization pressure. Piping between outside building wall and accessible attic space shall be without joints.

Figure 2 shows a design of sleeved service entrance for a basementless building.

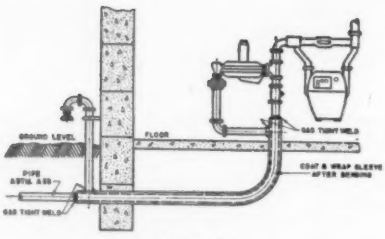


Figure 2

To be installed where service must be underground and cannot be exposed to temperature conditions that would affect service. To be installed under floors, concrete slabs or in crawl space. Can be made as long or short as necessary to reach meter location. Same design can be followed regardless of pressure. Carrier pipe is bare, A.S.T.M. A53—or equivalent. Sleeve and vent piping may be standard quality but coated and wrapped. Both pipes to be bent simultaneously. Carrier pipe to be tested for leaks after bending.

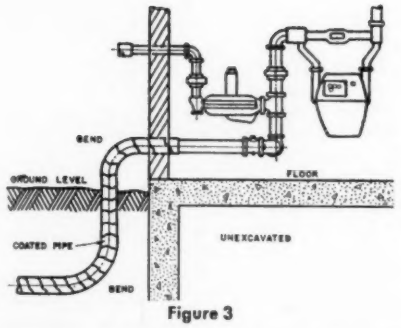


Figure 3

Figure 3 is a design of service entrance to basementless building where service pipe is brought up above ground exterior to building and enters building above grade.

This can only be installed where temperature will not adversely affect service and where an outside wall location cannot be provided for meter setting.

For technical details on this presentation, communicate with American Gas Association, 420 Lexington Ave., New York 17.

Protective pipe coatings

Current PIPE PROTECTION Topic

THE value of the protective coating is only equal to materials used, method of application and final inspection of the finished job, N. P. Peifer, corrosion engineer, The Manufacturers Light & Heat Company, said at the American Gas Association distribution, motor vehicles and corrosion conference at Montreal, in explaining how maximum protection against corrosion may be had from various coatings used with underground pipelines.

Many installations are completed with very poor inspection. Some poor jobs can be traced to lack of knowledge of the type of coating to be used, poor control of coating temperature, poor pipe cleaning operation, applying coating over dead primer, careless handling of coated pipe during lowering in and backfilling operation.

In recent years manufacturers of coating materials have so improved their product that it can be tailormade for application. Thus there is a coating for greater range of atmospheric temperatures, with one type for applications between 40°F and 200°F and another type for application between 0°F and 200°F.

Coatings for underground application may be divided into three general classifications; bituminous, waxes and greases, and plastic tapes.

These can be further broken down as to material and source.

1. Bituminous.
   a. Coal tar from distillation of coal.
   b. Asphalt from distillation of oil.
   c. Asphalt from natural asphalt beds.
2. Waxes and greases.
   a. Heavy consistency grease from distillation of oil.
   b. Wax from further distillation of oil.
3. Plastic tapes.
   a. Polyethylene from acetylene gas and hydrogen chloride.
   b. Polyvinyl chloride, from acetylene gas and hydrogen chloride.

The melting or softening point in coal tar and petroleum industries is used as a gauge of the consistency of the pitches and asphalts, and certain compositions made from them. The following is of importance in securing a coating for desired results.

1. High melting point bases and low filler content offer maximum resistance to soil stress or pressure deformation.
2. Low melting point bases and high filler content are less resistant to slide or sag.
3. Generally high filler content bases are of lower melting point and not highly resistant to soil stress or pressure deformation.
4. In a given melting point range, compounds of lower filler content can be applied at lower temperatures and are not subject to large evaporation loss. Higher filler content compounds may suffer a greater loss by evaporation.

Flowability can be stated as the application temperature required to secure a good flow and a given thickness of coating. In field application temperature of agitated enamel is watched carefully and thickness of coating checked with a pit depth gauge. The atmospheric temperature will control application temperature of the enamel.

Most enamels contain volatile liquids that will evaporate if heat is held to a high level for a considerable period. If the coating is held above recommended temperature flexibility will be lost and enamel will become brittle. It must be under continuous agitation to prevent coke formation.

When a pipeline is installed it is subject to mechanical forces generated by its contact with bottom of the ditch and by expansion and contraction of soil. The materials used to protect the pipe from corrosion do not have the strength to resist such mechanical stresses. To prevent excessive damage a wrapper is applied over and bonded to the enamel.

It is generally conceded that corrosion of underground pipe would not exist if moisture were prevented from contacting the metal. If coating waterproofs the pipe it prevents contact of the metal with its environment, which could adversely affect it. The water absorption rate of coal tar enamels is very low.

The mineral content of most pipeline enamels results from the addition of various minerals during manufacturing. The ash or filler content is of little significance until it is correlated with other data.

Since it is sometimes necessary to allow coated pipe to remain on top of the ground before installation, it is exposed to the sun and to atmospheric temperatures that may approximate the melting or softening point of the tar. The coating then will tend to slide or sag, reducing thickness on top of the pipe so that its value is greatly depreciated. The coating manufacturer has figures available for the area in which the pipe is to be installed and he can supply the proper softening point coating.

Primer will not stick to a dirty, wet or rusty surface and it is necessary that the pipe be clean before it is applied.

Although some coating men will state that a good bond can be secured if coating is applied over a primer that has been applied over mill oil or lacquer it has been found that a good bond is not secured.

Coal tar primers will gradually lose their volatile liquids after they have been applied to a metal surface for a period of time because of evaporation. The primer is dead when this occurs and if enamel is applied it will not bond. Dead primer will flake off when the fingernail is scraped over it.

There are manuals published by coating manufacturers that explain the general procedure when pipe is coated in the mill or over the ditch. The following will give some conditions noted during actual procedure which are not in the manuals.

A considerable number of faults are picked up by the jeep as soon as the coating machine kicks off. These may be relatively close together for a hundred feet or more. Look for:

1. Dust which will cause jeeps.
2. Moisture. Most primers contain a small amount of moisture. When the percentage exceeds 1 to 2% it will cause a considerable number of jeeps.
3. Coke. When coating machine is made ready for use it is customary to heat all parts. During this operation material from the last operation may change to coke. The particles of coke will cause jeeps.

When coating machine is put into operation parts of it may rub the pipe causing enamel to be too thin or removed. In flood coating types the iron is often found to rub. This is apparent when faults occur on either up or down grades.

As coating runs to coating machine it is giving off fumes which are volatile liquids evaporating because of the heat. This solvent will gather on the machine and drop off on coated pipe. When the jeep passes over these spots they will show a fault in coating.

Asbestos felts used for pipeline wrappers will absorb an amount of moisture. If moisture content becomes too high it will cause steam to form when hot enamel comes into contact with it. When steam is trapped under the wrapper it will cause a blister which will blow the enamel from the pipe surface. The remedy for this is to keep the felt in a good storage room and keep it from contacting dirt or cement floor.

If the material used to saturate the felt contains too much naphthalene, the naphthalene will form white crystals on the felt. The crystals will evaporate when heated enamels contact them and form a gas that may affect enamel in a manner similar to steam. It may also cause a sufficient loss of solvents to make the saturating material become brittle causing the felt to break when being used.

Most difficulties with mill coated pipe are met during unloading, stringing and bending operations. Protection of pipe at the welds often presents a considerable problem. Hot enamel, rubber tapes and plastic tapes are used for joint protection.

The chief constituent of a grease type coating is petrolatum. Grease coatings are applied over rusty metal but if a good coating is desired pipe should be cleaned.

Grease coatings should never be installed in dry soil unless a wrapper is applied to prevent soil from contacting the grease. The electrical resistance of a grease type coating is low even with a wrapper.

Waxes are applied to pipe at the coating mill and over the ditch by travel liners. Wrappers used in conjunction with this coating are generally tobacco cloth with an acetate backing. Asbestos felts are also used, but they are not saturated with asphalt or coal tar cut backs. The wrappers are bonded to the wax during application procedure and the entire coating is tested with high voltage electricity.

Plastic tapes have only recently come into use as a protective coating for underground and overhead pipelines. Their source is the chemical plant although their base materials are a natural product.

The film thickness of polyethylene tape is 8 mils, the adhesive 4 mils, making a total thickness of 12 mils. Polyvinyl chloride tape has an adhesive thickness of 2 mils making a total thickness of 10 mils. The additional thickness is important where the surface to which it is to be applied is rough, permitting the adhesive to extend to the bottom of the rough areas thus securing a stronger bond.

When a plastic tape is to be applied it is essential that metal surface be free of rust, dirt and dust. It has been found good practice to apply a primer to metal just prior to tape application and to apply an additional wrapper over the 10 or 12 mil tape as an additional protection against abrasion. Tar or asphalt saturated asbestos felt wrappers may be used. They are not bonded to the tapes and only act as an abrasion resistant wrapper.

Asbestos felt wrappers are composed of a mixture of asbestos and rag combined with a binder and saturated with an asphalt or tar cutback. There is a tendency for this wrapper to pick up moisture if it is not stored under proper conditions. This becomes apparent when a vapor is formed when hot enamel comes in contact with the felt. If vapor is trapped it will form a bubble in the coating leaving a weak spot that will cause a failure.

The wrapper is applied directly over the hot enamel as it is flooded or sprayed on the pipe, becoming tightly bonded to the enamel. Tension of the wrapper should be so adjusted that it does not pull through hot enamel and come in contact with metal surface. Excessive tearing of felt will indicate too much tension or it may be caused by evaporation of the volatile liquids out of the cutback used to saturate the felt.

Ordinarily a 15-lb felt wrapper is used as an outerwrap with hot enamels. However in the last few years a wrapper of 8-lb has been developed which has been reinforced with glass threads. While this wrapper has the strength of the 15-lb felt it is questionable if it has the abrasion resistance.

Glass outerwrap is a thick film of glass fibers saturated with a composition of tar and asphalt cutback and applied the same as asbestos felt over hot enamel coating. It does not bond to enamel as well as asbestos felt.

Glass in single filaments bonded together with bonding material is formed into a wrapper for hot enamel applications. Sufficient tension is applied to pull it into the enamel but not through to metal surface. This is said to add strength to the enamel and reduce the tendency to sag.

Rockshield is made from scraps from the manufacture of asbestos roofing and is used as an additional shield around coated pipe where considerable rocks are encountered or where pipe will be handled roughly. Because of its thickness it is installed in sheets that are fastened around the pipe with steel strapping or glass filament tape with an adhesive on one side.

Regardless of the care in applying protective coatings it will always be found that faults exist that will expose metal to earth or water. Such faults often become apparent when a penetration of the pipe wall occurs after a period of from 2 to 15 years. For this reason it is advantageous to install cathodic protection.

For technical details on this presentation, communicate with American Gas Association, 420 Lexington Ave., New York 17.

Air conditioning installations

Current DOMESTIC APPLIANCES Topic

IN a discussion of service and installation policies of Nashville Gas Company, Joseph P. McGovern, service superintendent, told a distribution session audience, Southern Gas Association, about various air conditioning practices and services.

Nashville Gas Company has a present total of 35,000 customers. It contracts all air conditioning erection and installation to local contractors. One contract electrician does all wiring; he is available to servicemen who are unable to do difficult electrical jobs.

After installation is completed, initial start up and check is prepared on a no-charge basis. Supervision for contractor and installation for start up is company-furnished.

The company offers free service, upon customer request, including adjustments of gas burners, input adjustment, temperature checks, and pumping unit. Each unit is checked on spring and fall changeovers, providing for cleaning and filling tower, checking temperatures, pumping units, and oiling. Cleaning of coils or replacement of filters is done on a time and material cost basis. Company stocks filters for air conditioning units only, which are charged for after original set.

Several customers have permanent type filters, furnished by local filter service company, and these are changed every 30 to 45 days. Nashville Gas replaces any parts in warranty, including units on a no-charge basis, either parts or labor, while all parts out of warranty are repaired or replaced on a time and material basis. Acidifying of units, which may be necessary after several years of operation, is performed on a no-charge basis.

The company has several jobs using city water and wasting the cooling water rather than using recirculating towers. Of Nashville Gas Company's total air conditioning installation, 74 units, 12 have been replaced for various reasons; most of them have been air leaks.

Company has had 3 servicemen and service supervisor attend a factory service school at Servel. Other servicemen are being used with these trained men so that a capable service organization can be built up to take care of all calls.

For technical details on this presentation, communicate with Southern Gas Association, 1032 Life of America Bldg., Dallas 2, Tex.

Price Indexes of Gas, Other Fuels and Electricity

GAS RATES to consumers were unchanged on the average in April, the latest month for which data from the Bureau of Labor Statistics are available. Changes in thermal content in 10 cities resulted in slight increases in the cost of gas for space heating and minor fluctuations in net monthly bills for non-heating gas.

A fuel adjustment in Boston caused a slight increase in net monthly electric bills there. However, the average for electricity rates was unchanged during April.

Seasonal reductions in the retail prices of coal and fuel oil resulted in declines in the BLS index. The bituminous reductions ranged from $0.25-to-0.75 per net ton; anthracited reductions were from $0.65-to-2.15 per net ton. Fuel oil No. 2 showed drops of $0.21-to-0.50 per 100 gallons.

Source: Bureau of Labor Statistics, U. S. Department of Labor (1947-1949 = 100.0)

	1954				1953									
	Apr.	Mar.	Feb.	Jan.	Dec.	Nov.	Oct.	Sept.	Aug.	July	June	May	Apr.	Jan.
GAS														
Space heating	114.1	113.9	113.7	113.6	113.6	113.5	112.8	112.4	112.5	111.2	111.2	110.9	111.1	108.9
Non-space heating	108.8	108.8	108.8	108.8	108.8	108.8	108.2	108.0	108.0	107.1	107.2	107.0	106.9	106.4
Natural														
10 therms	99.9	99.9	99.9	100.0	100.0	99.8	99.9	99.8	99.8	98.6	98.7	98.5	98.4	98.3
25 therms	112.3	112.3	112.2	112.2	112.2	112.2	111.4	111.3	111.3	110.1	110.2	110.0	110.0	108.9
Manufactured														
10 therms	109.4	109.4	109.4	109.4	109.5	109.5	108.2	108.1	108.1	107.4	107.4	107.4	107.1	106.9
25 therms	109.6	109.6	109.6	109.6	109.7	109.7	109.1	109.0	109.1	108.4	108.4	108.4	108.0	107.8
Mixed														
10 therms	96.4	96.4	96.4	96.4	96.4	96.4	96.4	96.0	96.0	96.2	96.2	96.2	96.2	96.2
25 therms	100.4	100.4	100.4	100.4	100.4	100.4	100.4	99.9	99.9	100.0	100.0	100.0	100.0	100.0
All types combined														
10 therms	105.2	105.2	105.2	105.3	105.4	105.3	104.8	104.7	104.7	103.9	103.9	103.8	103.7	103.5
25 therms	112.6	112.6	112.5	112.5	112.5	112.5	111.8	111.7	111.7	110.6	110.7	110.5	110.5	109.6
ELECTRICITY														
Composite	104.5	104.5	104.4	103.8	103.8	104.2	104.2	104.1	104.1	104.0	104.1	104.7	104.5	104.4
SOLID FUELS														
Bituminous—All sizes combined	119.5	120.6	120.6	120.7	120.6	120.4	120.2	119.5	118.3	118.0	117.3	117.6	119.2	119.8
Anthracite—All sizes combined	130.2	135.0	135.0	135.0	135.0	135.0	134.9	134.8	133.7	133.1	130.6	129.1	133.4	135.9
PETROLEUM														
Fuel oil No. 2	120.6	122.1	123.2	121.9	120.9	122.7	122.5	120.2	120.3	120.2	117.9	118.2	119.7	116.6

THE INDEX of retail prices of fuels and electricity, issued monthly by the Bureau of Labor Statistics, U. S. Department of Labor, considers specific consumption quantities of gas, 10 and 25 therms, representing typical usage by families represented in the Bureau's Consumer Price Index.

Monthly gas bills, net, are basis for computing the index. Data are collected in these cities:

NATURAL GAS	Detroit	New York
Atlanta	Houston	Pittsburgh
Baltimore	Kansas City	St. Louis
Cincinnati	Los Angeles	San Francisco
Cleveland	Minneapolis	Washington
MANUFACTURED GAS	Portland, Ore.	
Boston	New York	Scranton Seattle
MIXED GAS	Chicago	Philadelphia

The index for electricity is based upon data collected in the same list of cities.

Anthracite prices are collected in 9 large and small cities; bituminous prices in 26 large and small cities; fuel oil No. 2 prices, from 11 cities.

The base period of the index is the average for the years 1947, 1948 and 1949. That average is referred to as "100.0."

Month-to-month net retail prices and applicable taxes are compared with the base, and computed to express, as an index number, any change from the base. While these indicators are numbers, they may be interpreted directly as percentages of change from the base period.

Examples: A current index number of 121.8 indicates a 21.8% increase from the base period; an index number of 96.4 indicates a decrease of 3.6% from the base period. This percentage comparison is applicable only from the current index to the base period.

Percentages of change from one index number to another comparable index number, other than the base (100.0), can be calculated: Subtract the older number from the new number, then divide the difference by the older number.

Examples: Older number is 115; newer number is 125; difference is 10. Divide 10 by 115; answer is 0.0869, or an 8.7% increase. Older number is 125; newer number is 115; difference is 10. Divide 10 by 125; answer is 0.080, or an 8.0% decrease.

Index of Yields: Selected Utilities Stocks

Expressed as percentages

	1954						1953							
	June	May	Apr.	Mar.	Feb.	Jan.	Dec.	Nov.	Oct.	Sept.	Aug.	July	June	Jan.
Transmission companies	4.04	4.08	4.15	4.17	4.25	4.21	4.39	4.44	4.44	4.90	4.46	4.76	4.72	4.04
Transm. & distrib. companies	5.01	5.01	5.11	5.27	5.39	5.39	5.54	5.49	5.58	5.74	5.13	5.41	5.55	5.02
Manufactured & mixed companies	4.45	4.46	4.67	4.68	4.66	4.66	4.91	4.75	4.94	5.14	4.99	5.05	5.08	4.87
Class "A" electric companies	4.60	4.64	4.70	4.68	4.92	4.92	5.10	5.15	5.14	5.41	5.27	5.41	5.53	5.08
Class "B" electric companies	4.83	4.94	4.94	4.93	5.01	5.14	5.23	5.14	5.37	5.61	5.50	5.41	5.68	5.19

This is a straight arithmetical index of comparative yields obtainable on a selected group of gas and electric utility industry common stocks.

The companies comprising this index have been selected by the AMERICAN GAS JOURNAL as providing a representative cross-section of each industry, from the standpoint of geographical diversification and of the relative importance of the individual companies in their areas.

No effort has been made to weight the average to give effect to changes in capitalization or in dividend rates because the yields afforded on the issues reflect such changes. The index is designed to show the rate of return and not necessarily market movements on the stocks comprising it.

This index is compiled from: natural gas transmission companies, 5; natural gas transmission and distribution companies, 5; manufactured and mixed gas companies, 4; class "A" electric companies, 4; class "B" electric companies, 5.

Observers See Favorable Factors Indicating Stable Business Level

by John F. Falvey
Financial Editor

BOND and stock prices have been edging forward of late under the influence of a number of developments. Probably the most tangible of these have been the gains shown in the economic indices. The Reserve Board index of industrial production at last report was up two basis points, for the first gain since the summer of 1953; the Commerce-Labor departments now estimate a new high for construction activity this year, against the modest decline they previously had anticipated; steel output and use of electricity both are above a year ago levels; exports and imports have been showing sharp gains; consumer credit and debts are falling off; and personal income is on the increase.

Faced with this array of favorable factors, even the most conservative observers of the economic scene now seem willing to admit that it looks as if the business recession has petered out.

Add to these aforementioned developments the recent action of the Federal Reserve Board in reducing member bank reserve requirements by $1,500 million, which should have beneficial effect on financing by the Treasury and by business. In some financial quarters the move is interpreted as a determination by the Reserve Board that it will not be judged too late with too little, a charge which had been leveled against it in the not too distant past.

Discussing the Federal Reserve step, the New York investment firm of Franklin Cole & Company, close observers of economic developments, said in their Current Comment on June 22: "The effect at first will probably be most telling in the short-term market. Insofar as the stimulation to business is concerned, however, interest rates are a more decisive factor on long-term building projects than on inventory buying. The stimulation of construction, both private and public, of lower interest rates fits into the Administration's general policy of emphasizing a continued high level of capital investment. New offerings of state, municipal, and other public bodies are likely to exceed the volume of the latter half of 1953 by $500 million or more.

"Another significant inference to be drawn from the Federal Reserve Board's action is that, so far as can be foreseen at this time, the national budget does not threaten to upset the overall picture of stability despite the situation in the Far East with a certain amount of leeway or give. Discussion of defense expenditures leads to the conclusion that within the $29-30 billion new military budget and unexpended balances estimated at around $2 billion there is sufficient flexibility to meet emergencies. It is noteworthy in this connection that the Senate's version of the new military budget, while providing for a $2.3 billion cut in appropriations for the Army, reduces the Air Force appropriation only by $185 million. A budget which does not involve a substantial expansion of expenditures and the risk of a serious deficit improves the chances of the enactment of the tax bill without important amendments and also permits the general economic policy of the Administration to be tested under more favorable conditions.

"With institutional purchases of common stocks assuming more importance, the link between the money market and the stock market seems destined to grow stronger. Lower interest rates will have their most marked effect on public utility, bank, insurance and other investment quality equities aside from the direct impact on high-grade bonds and preferred stocks. Generally speaking, the latest action of the Federal Reserve authorities is another development justifying the belief that the trend toward a higher ratio of price to earnings and dividends will continue."

Order restored

Anticipation of the reduction in reserve requirements has combined with a continually swelling volume of institutional funds to permit restoration of order to the corporate bond market. The balance of unsold portions of new issues in dealers' hands recently started to move, with the result that refunding operations which had been postponed due to unfavorable market conditions now are being restored to the calendar. Breaking of the log-jam is not coming any too soon, especially when it is considered that at one time last spring investment dealers had on their shelves somewhere between $200 and $300 million of unsold bonds. The unsold balances of new corporate issues in syndicate remained this spring at higher levels and for a longer time than at any previous time in the past four and one-half years.

The surplus of funds seeking investment should continue to increase and place higher premiums on the available supply of high grade investments. How soon this latter development will be witnessed and to what extent is conjectural at the moment, but we might cite here the thoughts expressed recently to a group of analysts by a partner of one of the leading New York investment banking firms. He made the unqualified prediction that top grade corporate bonds would go to a 2¾% yield basis and top notch preferred stocks would go to a 3½% level, but he did not set any time-table for the development.

While the margin predicted between yields on top-grade corporate bonds and preferreds is an extremely narrow one, growing emphasis is being placed in financial quarters on the advantage to institutions of preferred stocks in place of tax exempt obligations, due to the inter-corporate dividend tax exemption.

Common stock investment by insurance companies and pension funds, in fact, recently has been about double what it was a year ago at this time. The reason is clear if the remarks expressed on the subject by an official of one of the large New York life firms are to be accepted as a criteria. In brief, he pointed out that by foregoing tax exempt bonds yielding three % and investing in common stocks at five %, the institutional investor could experience a shrinkage of 87% in its investment over a 20-year span and yet have the same asset value as if the original investment had been made in tax-exempt bonds.

Latest reported figures show that pension fund buying of common stocks has been running at an annual rate of between $300 and $400 million, while life insurance companies in the first quarter of this year bought $52 million of common shares, against $27 million in the similar 1953 period. The life company purchases still represent only a small portion of potential purchases from this source. Even at this level, institutional and pension fund buying of equities is an important factor, and promises to be so over the future.

In the initial quarter this year total new offerings of preferred and common stocks amounted to only $450 million and, except for gas and electric utility common stocks, major companies offered practically no additional shares.

Nor does the financial position of industry promise any near-term change in this situation, in the opinion of close observers of the stock market and of corporate finance. The investment supply of investment quality stocks, especially in the industrial category, is not being increased but is being reduced by demand from institutional investors interested primarily in income.

Basis for this prediction is afforded in the trend of equity financing witnessed to date this year and in prospect. Most recent calculations show that common stock offerings by utilities in 1954 have been aggregating only a little more than 20% of the total financing, compared with about 45% in the corresponding interval of 1953. And the month of June—incomplete at this writing—is expected to continue the trend.

Coming to market during the first half of this year with an estimated $900 million of securities, which accounted for about half of the total corporate new offerings, the gas and electric utility companies have had a relatively favorable market on which to finance.

Granted that offerings of bonds are sufficiently well timed so as to avoid any recurrence of glut conditions, and consequent indigestion in the new issue market, there is no reason at the moment for anticipating less favorable marketing conditions in the final half-year than prevailed during the first six months. Rather, an even more propitious marketing opportunity may present itself over the months ahead.

INDEX OF YIELDS:
SELECTED UTILITIES STOCKS

See bottom of facing page.

Old Days Recalled... from AMERICAN Gas Journal

ESTABLISHED 1859

90 YEARS AGO

July 1864

GAS FITTING. *The importance of employing the best mechanics for gas fitting, is not sufficiently appreciated by the public. In one establishment, where 50 brilliant five-feet burners were wanted, the party was continually changing burners. Upon examination it was discovered the pipe from the main was only capable of supplying about 100 cubic feet per hour, when 200 cubic feet was required! There are gas fitters in abundance in every part of the city, but we would advise parties employing them to be certain that they understand their business well.*

50 YEARS AGO

July 1904

MR. JOHN R. CULLINANE, who since 1886 acceptably managed the properties of the Dennison Light and Power Company, has resigned that charge in order to accept the place of Manager to the Texarkana (Tex.) Light and Power Company, in which concern he has acquired a considerable interest.

JULY 1904

ATWATER, MINN., is said to want a gas works in its midst. The place is too small.

JULY 1904

MR. ALBERT F. KERSTING, formerly in the service of the Pittsfield (Mass.) Coal Gas Company, has been appointed Resident Manager of the Florence (Ala.) Gas Light and Fuel Company.

JULY 1904

SOME CAPITALISTS largely interested in real estate holdings in certain growing suburbs of Norfolk, Va., are arranging for the construction of a works for the supply of gas to the districts concerned. They have been impelled to this step by the unwillingness of the proprietors of the City Gas Works to extend their main system.

JULY 1904

AT THE ANNUAL MEETING of the shareholders in the Louisville (Ky.) Gas Company the Directors chosen were: H. V. Loving, D. X. Murphy, F. M. Sackett, Udolpho Snead and John Stites. A disgruntled holder named Rowan Hardin attempted to defeat the regular ticket, but his shrift was short.

JULY 1904

MR. JAMES FERRIER, who has served the Columbus (Ga.) Gas Light Company as General Superintendent since 1892, has accepted the position of President and General Manager of the Rome (Ga.) gas works. His successor at Columbus is Mr. MacDugald Dexter, who has been with the Columbus Company since 1897.

JULY 1904

THE MOONTABLE SYSTEM on public lighting account has been put out of practice by the authorities of Lafayette, Ind. High time, too.

25 YEARS AGO

July 1929

A GAS TRANSMISSION LINE, *25 miles in length, running from Michigan City, Ind., to South Bend, was begun on June 1, by the United Engineers and Constructors Company, operating under a contract with Northern Indiana Public Service Co. The new line will be the final link in a gas transmission system, 65 miles long, connecting the company's gas distribution center in East Chicago with South Bend.*

JULY 1929

THE EXECUTIVE AND SALES *personnel of American Meter Company assembled recently at the Metric Metal Works Div., Erie, Pa., for a three day conference devoted to developments in gas measurement and to the consideration of practical methods for making sales and engineering service increasingly effective.*

JULY 1929

THE FIRST *Gas Appliance Course sponsored by the Home Service Committee of the American Gas Association opened at the American Gas Association Laboratory in Cleveland, O., on June 24th. There were nearly 40 representatives from gas companies in various parts of the country registered for this course. . . . Mr. R. W. Gallagher, President of the East Ohio Gas Company and Chairman of the Laboratory Managing Committee, welcomed the students and pointed out that the purpose of the Laboratory was to develop the right type of appliance for use of gas consumers and brought out the fact that the pupils taking this course had an opportunity to learn of the work being done at the Laboratory and in turn bring to the gas companies they are connected with the necessity of selling approved appliances.*

JULY 1929

CONSTRUCTION *of what is to be one of the world's largest natural gas compressor stations at Sterlington, La., has been announced by the Arkansas Louisiana Pipe Line Company. The compressor will be used in connection with the company's new 100-mile, 20-inch pipeline being built from Monroe to Shreveport, and also will be connected with the 16-inch line to El Dorado, Ark., which was recently acquired by the company. The cost of the project will be approximately $1-million.*

AMERICAN

Gas Fundamentals

OUTLINE

NATURAL GAS
- *Geology
- *Drilling and completion
- *Methods of estimating reserves
- *Chemicals from gas
- *Natural gas conservation
- *Underground storage of natural gas

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***Chapters published since Jan. 1951.**

How to Use the Material

American Gas Fundamentals *is a comprehensive compilation of basic gas facts to guide any gas utility employee toward a broader understanding of the industry as a whole.*

The series is designed to be removed from each current issue of AMERICAN GAS JOURNAL *and filed in a ring binder where it may be accumulated into a text book of permanent usefulness. Material should be filed under the major subject head appearing in the upper right hand box at the head of each chapter.*

Glossary of Gas Industry Terms: Vac to Zon

V

VACUUM DISTILLATION Distillation at lower than atmospheric pressure and, consequently, lower temperatures.

VACUUM HEATING SYSTEM A two-pipe steam heating system which is so arranged that it can be operated below atmospheric pressure if desired.

VALENCE A property of atoms determining the number of other atoms with which they can combine in chemical reactions.

VALVE A mechanical device for controlling the flow of fluids; types such as gate, globe, needle, plug and diaphragm valves, are used.

VALVE BOX A housing around an underground valve to allow access to the valve and to protect the valve from mechanical damage or the effects of weather.

VALVE CHAMBER The space in a gas dry-meter containing the slide valves and mechanism for their operation.

VALVE CONTROL A fuel-air ratio control system which operates by means of mechanical linkage of related valves.

VALVE MANIFOLD A piping manifold having several valves connected in the piping.

VANE BLOWER A gas-moving mechanical device consisting of one or more movable vanes set into a rotor which is eccentrically mounted in a sealed circular housing. The vanes are spring-loaded to hold them against the inner surface of the housing as the rotor turns. As the rotor turns, gas from the housing inlet is picked up between vanes and rotor, compressed and discharged from the outlet of the blower case or housing.

VAPOR A gaseous state of a liquid brought about by heating, reduction of pressure, or both.

VAPOR DENSITY The weight of a gas or vapor relative to an equal volume of some standard gas at the same temperature and pressure.

VAPOR HEATING SYSTEM A steam heating system operating near atmospheric pressure and returning condensate to the boiler by gravity.

VAPORIZATION The conversion of a liquid to a gaseous state.

VAPORIZING OIL BURNER A burner which vaporizes the oil in a single step, before combustion, by the direct application of heat to the liquid oil.

VAPOR PRESSURE The pressure caused by vapor over the surface of a liquid in a closed container; caused by the higher kinetic energy of the molecules of vapor.

VAULT An enclosed room or pit having an access opening in the top or side wall, or both. May be in a building, a separate aboveground structure or underground.

VELOCITY The number of distance-units a body moves in a unit of time, such as miles per hour or feet per second.

VELOCITY PRESSURE The pressure exerted by a fluid due to its motion, as distinguished from the static pressure exerted against the walls containing the fluid. The total pressure is the sum of the velocity pressure and static pressure.

VENT An opening in a tank or other piece of equipment, sealed to prevent escape of material within the equipment at normal pressures, but so arranged that it automatically opens to relieve excessive pressure in the equipment. Can also be arranged for manual opening to depressure equipment as desired.

VENTILATION The supplying or removing of air to or from any given space.

VENT PIPES Pipes used to conduct the discharge of a vent to a suitable location.

VENTURI METER A fluid-flow meter in which the rate of fluid-flow is determined by measuring the pressure drop caused by the flow of the fluid through a Venturi throat or tube. The pressure drop across the tube is proportional to the fluid flow rate.

VENTURI THROAT OR TUBE A tube tapered down to a lesser diameter in the middle of its length and then expanding gradually to its original diameter. Pressure-measuring taps are provided at the entrance and at the constricted throat for determining pressure differential through the tube.

VERTICAL BOILER (See Boiler.)

VERTICAL RETORT A coal gas manufacturing retort with the long axis in a vertical position.

VISCOSIMETER OR VISCOMETER A viscosity-measuring instrument.

VISCOSITY The resistance of a fluid to flow due to the combined effects of adhesion and cohesion.

VISCOSITY, ABSOLUTE Measure of fluid-resistance to flow, irrespective of density. Equal to the kinematic viscosity multiplied by the density of the fluid. Also called dynamic viscosity.

VISCOSITY, KINEMATIC Measure of fluids' relative resistance to flow, including the density effect of the fluid.

VISCOUS Having a high viscosity.

VOLATILE STILL A still used to recover ammonia from coal gas wash water by heating the ammoniacal liquor and driving off the ammonia.

VOLATILITY The relative ease with which a liquid can be vaporized.

VOLUME, COMBUSTION The volume occupied by the flame and invisible combustion zone of a burning fuel.

VOLUME FLOW RATE The number of unit-volumes of a fluid flowing past the measurement point in a unit of time, such as gallons per hour or cubic feet per minute.

VOLUME, SPECIFIC The volume of a unit weight of a

substance at specific temperature and pressure conditions.

VOLUMETRIC ANALYSIS The percentages by volume of the various constituents in a substance.

VOLUMETRIC EFFICIENCY Ratio of the volume of fluid discharged from a pump or compressor to the volume displaced by the piston.

W

WALL LOSS Loss of heat through the walls of a furnace or tank.

WARM AIR HEATING SYSTEM A heating system consisting of a furnace enclosed in a casing from which ducts distribute heated air to various rooms of a building. When air flow through the system is caused by difference in weight between heated air and cooler return air, it is a gravity system; a forced system has a fan or blower to move the air; a perimeter system discharges warm air at floor level around the outside walls of the building and collects return air at ceiling level at interior walls.

WARM-UP TIME The time required to heat a furnace, boiler or other equipment to the operating temperature.

WASH Removal of impurities from a gas or vapor by passing the gas through water or other liquid, which retains or dissolves the impurity.

WASH BOX A part of a carburetted water gas set, consisting of a partially water-filled, gas-tight box through which the gas from the generator is passed to wash out impurities. Also acts as a water seal to prevent return of gas into the water gas set.

WASHER A shell with internal baffler or packing, so arranged that gas to be cleaned passes up through the baffles counter-current to the flow of scrubbing liquid down through the washer. The baffler or packing cause intimate contact and mixing of the gas with the liquid stream.

WASHER COOLER A washer, in the form of a tall tower, in which the washing liquid is sprayed in at the top, is collected in the bottom of the tower, and then is cooled and recycled through the tower. Serves a dual purpose of washing the gas free of impurities and also cooling the gas.

WASTE Uncompensated loss. Also, a mass of wool or cotton threads used to clean machinery.

WASTE GAS The gaseous combustion products, such as carbon dioxide and nitrogen, which leave the combustion zone and are discharged to the surrounding atmosphere. Also called stack gas or flue gas.

WASTE GAS FLUES Pipes, passages or ducts connecting a combustion chamber to a draft stack or chimney.

WASTE HEAT BOILER A heat exchanger set into a flue or stack. Water is passed through the exchanger and converted to steam by the heat of the flue gases. This heat would otherwise be lost up the chimney.

WATER GAS REACTION When steam is passed through an incandescent coal or coke bed, a chemical reaction occurs in which the steam is disassociated to hydrogen and oxygen. The oxygen reacts with the carbon of the coal or coke to form carbon monoxide. The resulting mixture of hydrogen and carbon monoxide is known as blue or water gas.

WATER GAS TARS Tars produced from cracked oil vapors in the carburetted water gas manufacturing process.

WATER GAUGE A device to measure the amount or level of water in a tank or boiler; alternately, a pressure measuring device, usually a "U" tube, for determining small pressures in inches of water.

WATER HARDNESS Calcium and magnesium salts dissolved in water prevent suds formation with soap by reacting with the soap. Water exhibiting this hardness will cause scaling in a boiler or water heater.

WATERLESS TYPE GAS HOLDER A large cylindrical, vertical shell containing a gas-tight, movable piston which moves up and down as gas is pumped in or out of the shell.

WATER LEVEL SHUT-OFF CONTROL An automatic device which shuts off the fuel to a boiler or water heating plant when the water level falls below a pre-determined minimum.

WATER PAN An open water container placed inside a furnace warm air heating system. As the heated air passes over the pan, water evaporates and raises the humidity of the air to the desired condition.

WATER SEAL A device, containing water for prevention of gas flow. Sometimes used to prevent flow altogether, sometimes to prevent flow other than in one direction, sometimes used as a safety blow-out. Basically, it is a gas-tight container, partially filled with water, having one pipe connected into the shell and another pipe passing through the shell and extending below the water level.

WATER SEALED GAS HOLDER A low pressure gas holder consisting of cylindrical sections or lifts telescoping into a water-filled pit or tank, with the inside section closed in on top. As gas is admitted under the inside section, it floats up in the water, carrying successive outside sections up as it rises, by means of cupped lower outside edges of each section engaging hooked upper inside edges of the next section. The guide framework around the sections stops the upward motion before the last, or outer, section leaves the water.

WATER SOFTENER An additive substance for hard water which overcomes or prevents the action of the dissolved salts causing hardness.

WATER TUBES Heat exchange equipment in which water flows inside tubes to exchange heat with another fluid surrounding the tubes is called water tube equipment and the tubes are called water tubes.

WEIGHT Force of attraction of the earth for a body, measured in units of mass such as pounds, grams or ounces.

WEIGHTED GOVERNOR (See Loaded governor.)

WEIGHT FLOW RATE The number of unit weights of a material flowing by the measuring point in a unit of time, such as pounds per hour or tons per day.

WEIGHT, SPECIFIC Weight of a unit volume of a substance.

WELD To join two pieces of similar metal together by depositing molten metal of the same kind on the edges of the joint in a manner that produces a homogenous unit of deposited metal and melted edge metal.

WELDED PIPE Skelp shaped into tubular form and welded along the edges to form a tube or pipe.

WELDING RODS Special composition metallic rods used for making welded joints.

WELL A hole drilled into the earth to tap underground reservoirs of oil, gas or water.

WELL CASING Steel pipe used to line a well.

WELL RIG All the equipment required to drill, case and finish a well.

WELSBACH MANTLE LAMP OR INCANDESCENT MANTLE LAMP A type of lamp in which the flame impinges on a knitted cup or mantle saturated with certain chemical compounds which are heated to incandescence and emit a bright, white light.

WET BULB TEMPERATURE Temperature indicated by a thermometer having a water-saturated wick surrounding the bulb. When this is moved rapidly through the air as with a sling psychrometer, the evaporation of water from the wick cools the thermometer. The temperature reading obtained is indicative of the amount of water vapor in the air.

WET DRUM METER A large-capacity gas meter consisting of a cylindrical drum mounted to revolve inside a shell half-filled with water. Spiral partitions divide the drum into four sections along the axis. The water prevents the gas from by-passing the drum and the gas forcing through the spiral chambers rotates the drum proportionately to the quantity of gas passing through the meter.

WET GAS Natural gas from a well, containing considerable amounts of light gasoline fractions.

WET STEAM Steam containing some condensed liquid water in the form of a mist.

WIND FURNACE Natural draft furnace.

WORK The application of force to cause motion or change of motion.

WORKING PRESSURE The pressure at which a piece of equipment normally operates.

WRAPPED PIPE Pipe which has been covered with a chemically inert compound and a protective layer of fiberglass or kraft paper to cover the coating compound and keep it in place.

X

XYLENE A coal tar derivative, higher boiling and slower evaporating than benzine or toluene.

Y

YIELD The amount of desirable product obtained from a process or operation. Sometimes expressed as a percentage of the material used in the process.

Z

ZERO, ABSOLUTE A state of matter in which there is no molecular motion and equal to —273.18°C or —459.72°F. Under the general law of gases, a gas would have zero absolute pressure at absolute zero.

ZERO GAS Gas at atmospheric pressure.

ZONE, CONTROL Sections of heating equipment, such as a furnace, oven, still or boiler, in which the temperatures are individually controlled by instruments that actuate fuel valves in accordance with the specific process cycle requirements for time or temperature or a combination of both.

The Glossary of Gas Industry Terms, of which this is the ninth installment, was compiled by Robert M. Poe. Additional terms will be gathered for supplementary publication as their number warrants.

Abbreviations and Contractions

ALLOW. allowable
ABS absolute
APPROX. approximate
AUTO. CIR. TANK automatic circulating tank
AUTO. INST. automatic instantaneous
AUTO. PILOT automatic pilot
AUTO. STG. automatic storage
BAR. barometer
B G blue gas
BTU British thermal unit(s)
CFM or CFM cubic feet per minute
C.I. or C.I. cast iron
CIR. TANK circulating tank
COG coke oven gas
CP certified performance
CU FT cubic foot or cubic feet
CU FT/HR. cubic feet per hour
C.V. calorific value
CWG or CW GAS carburetted water gas
D density
°C. degrees Centigrade
°F. degrees Fahrenheit
DIAM. diameter
DIST. distribution
DMS drill manufacturers' size
EFF. efficiency
EMF electromotive force
F.O.T. fuel cost plus oil cost minus tar credit
FPM feet per minute
GPM gallons per minute
H.P. high pressure
ID or I.D. inside diameter
IN-LB inch-pound
L.P. low pressure (under 10" w.c.)
LPG or LP GAS Liquified Petroleum Gases
MAX. maximum
MCF thousand cubic feet
MFD. manufactured gas
MIN minute(s)
MIN. minimum
MOL. WT. molecular weight
MPH miles per hour
MV millivolt(s)
NAT. GAS natural gas

GLOSSARY

NON-AUTO. STG. non-automatic storage
OD or O.D. outside diameter
OPER. REV. operating revenue
PG producer gas
RPM revolutions per minute
SAT. saturated
SEC second
SP GR specific gravity; air = 1.0
SP HT specific heat
TEMP. temperature
T.R. or T.R. temperature rise
V volume
W.C. water column
W.I. or W.I. wrought iron
WR'T. wrought

Symbols

A Area of section, in square feet.
C^1 Orifice flow constant.
D_1 Diameter of pipe at upstream pressure connection, in inches.
D_2 Diameter of orifice, in inches.
F_b Basic orifice flow factor.
F_g Specific gravity factor.
F_{pb} Pressure base factor.
F_{pv} Supercompressibility factor.
F_r Reynolds number factor.
F_{tf} Flowing temperature factor.
F_{tb} Temperature base factor.
G Specific gravity of flowing gas; dry air = 1.000.
g Acceleration due to gravity, in feet per second^2.
h Differential head in terms of the flowing fluid at the average density at the upstream pressure connection, in feet.
h_w Differential pressure, in inches of water.
K Coefficient of discharge, including velocity of approach.
k Ratio of the specific heat at constant pressure to the specific heat at constant volume.
N Difference between the actual and the theoretical density of P_f expressed as a decimal fraction of the theoretical density.
P_b Absolute pressure at reference or base condition, in pounds per square inch.
P_{f1} Absolute static pressure at upstream pressure connection, in pounds per square inch.
P_{f2} Absolute static pressure at downstream pressure connection, in pounds per square inch.
Q_h Quantity rate of flow at base conditions, in cubic feet per hour.
Q_f Quantity rate of flow at flowing conditions, in cubic feet per hour.
Q_s Quantity rate of flow at flowing conditions, in cubic feet per second.
R_d Reynolds number at plane of orifice.
T_b Absolute temperature at reference or base condition; Fahrenheit temperature + 460°.
V_f Velocity of fluid at plane of orifice, in feet per second.
x Ratio of differential pressure to static pressure at upstream pressure connection.
Y_1 Expansion factor, based on upstream static pressure.
Y_2 Expansion factor, based on downstream static pressure.
Y_m Expansion factor, based on intermediate static pressure.
β Ratio of orifice diameter to upstream pipe diameter.
μ Absolute viscosity of flowing fluid (assumed as 0.0000069 for natural gas at 60°F.), in pounds per second foot.
ρ Density of gas at flowing conditions, in pounds per cubic foot.
ρ_a Density of dry air at 14.70 pounds per square inch absolute pressure and 32°F., in pounds per cubic foot.
ρ_b Density of gas at pressure P_b, in pounds per cubic foot.
ρ_w Density of water at 60°F., in pounds per cubic foot.

Trademark and Copyright Laws Affecting Gas Companies

by Leo T. Parker
Attorney at Law
Cincinnati, Ohio

A LETTER recently received from an official of a gas company read in part as follows: "Our company advertises, sells and installs gas and electrical appliances. Assuming that a manufacturer or seller has no trademark, tradename, patent or other registration, what chance has he to stop competitors or employees from using his secret processes? What are the legal distinctions and differences between trademarks and tradenames? And are the laws and liabilities pertaining to trademarks and tradenames similar to those of unfair competition?"

A recently decided court case illustrates the rights and liabilities of gas companies, employees and competitors, relative to secret processes, and faithful business dealings.

Modern courts consistently hold that the owner of a secret process has a legal right to expect that employees shall serve faithfully and guard such processes against unauthorized use by competitors. The courts require that employees are obligated to serve their employers faithfully, and not divulge trade secrets to competitors. If an employee violates this rule he must pay back all salary and other compensation received from his employer. Another point decided by a late court is: A competitor who uses a trade secret is liable and must pay its profits to the one whose trade secret it utilized.

In A. Hollander Son v. Imperial Corp., 66 Atl. (2d) 319, testimony showed that one Singer owned and operated a business, but later went bankrupt. He later went to work as manager of a corporation and was paid under a written contract containing a clause that he would not divulge any of the corporation's trade secrets or processes. Soon afterwards Singer secretly organized a competing company, the Imperial Corp. He kept in communication with the latter company but did not appear at its plant for fear of disclosing his interest to the corporation.

Later, the corporation sued Singer and the Imperial Corp., and asked the court to award it the profits earned by the latter company, and to compel Singer to repay $15,000.00 salary received during the past two years while the Imperial Corp. was in operation. The court held in favor of the corporation, and said:

"Singer is not entitled to retain the salary paid to him amounting to $15,000.00. These payments were made at a time when he was actively pursuing outside business activities contrary to the employment agreement."

Legal distinctions

The distinction between a trademark and tradename resides in the fact that a trademark is applied exclusively to merchandise or products, whereas a tradename is the name of a business, individual, partnership firm, or corporation. In more detailed explanations the legal distinctions are as follows: It is well-settled law that a trademark is intended to establish in the minds of the buying public the quality and kind of products the mark represents.

A tradename is the name of a business, partnership, corporation or individual.

The trademark laws provide for registration in the United States Patent Office of any distinctive "name or symbol" of salable merchandise. Also, a trademark must be attached to merchandise, and a new trademark must be different in all respects from marks previously used and registered. This assures the public that a new mark will not infringe the trade and good will of the original user of a similar trademark.

The courts hold that the original purpose of trademark laws was not only to protect manufacturers, buyers, sellers and owners of trademarks, but also to protect purchasers and consumers against deception and confusion. Hence, where testimony shows that purchasers of merchandise will not be deceived, two sellers or companies may use the identical trademark in different territories if neither company practiced fraud. See Western, 149 Fed. (2d) 1019. Modern courts consistently hold that two manufacturers or sellers may use the same trademark in the same territory if testimony shows the original user was not diligent in filing suit and completing legal procedure to stop a competitor from using a similar, or the same, trademark. This law is particularly applicable where testimony fails to show that the competitor practiced fraud. See Busch v. Du Bois, 175 Fed. (2d) 370.

While the average company official may determine with considerable certainty whether one trademark infringes upon another, this is not so with respect to patents. A great deal of study and experience is required to decide whether a particular patent is infringed. No one infringes a trademark unless the testimony shows conclusively that the public will be confused or deceived. However, a patent is infringed by anyone who makes, sells or uses a device, process, or composition described in one or more "claims" in the patent. In other words, a patentee is restricted by the "claims" in his patent.

A copyright merely gives protection against "copying" of another's formulation, label, picture, composition, work of art and the like. A copyright cannot afford any protection against infringement of a trademark, tradename or patent.

A company may obtain a valid copyright on labels for use on products or containers. Therefore, while a valid trademark may be issued only to the individual, firm or corporation which uses the mark on the product, the copyright laws enable one to claim a copyright on a design or label for any product. See Hoague-Sprague Corp. v. Frank C. Meyer Co., 31 F. (2d) 583.

According to a recent court if a trademark is merely suggestive or descriptive it affords only "weak" protection to its user. In Majestic Co. v. Majestic Electric Co., Inc., 172 Fed. (2d) 862, testimony showed that for more than 50 years a company has manufactured under the trademark "Majestic" coal and gas stoves and ranges, and electric hot plates. Majestic Electric Co. manufactures and sells electric irons, toasters and appliances, on which it later adopted the trademark "Majestic."

The former company sued Majestic Electric Co. for trademark infringement and unfair competition. The court refused to hold that infringement existed, and said:

"There is no specific competition between the parties, and the trademark is not original, arbitrary or fanciful; . . . We note that there was no proof of any confusion in the minds of customers as to the source of the products of the respective parties. . . ."

Suit involves color

Considerable discussion has originated over the question: When is color a satisfactory element of a trademark? The answer is: Only when it is used in combination with a design, picture or geometrical figure.

In Campbell v. Armour, 175 Fed. (2d) 795, a company filed suit for damages and asked the court to grant an injunction to stop the use by a competitor of a red and white label used on some of its products. The court refused to hold in favor of the company, saying:

"What the plaintiffs (company) are really asking for, then, is a right to the exclusive use of labels which are half red and half white for products. If they may thus monopolize red in all of its shades the next manufacturer may monopolize orange in all its shades and the next yellow in the same way. Obviously, the list of colors will soon run out. That a man cannot acquire a trademark by color alone has been stated a good many times in decisions."

For comparison, see Pacific Coast Condensed Milk Co. v. Frye and Co., 147 P. 865. The court said:

"The primary colors are few, and as the evidence shows those suitable for light products are even more limited. To allow them to be appropriated as distinguishing marks would foster monopoly by foreclosing the use by others of any tasty dress."

See also, Heddon's Sons v. Millsite Works, 6 Cir. 128 F. (2d) 6. This court held that color is a lawful element of a trademark only if it is used in combination with a distinctive design.

The Federal Trade Commission has powers under United States Statutes to prevent manufacturers and sellers using unfair methods of competition. The Trademark Act was intended to prevent manufacturers and all other sellers from selling mer-

Turn to page 35—PARKER

News of the Gas Industry

Con Edison in 1954 Gas Promotion

The most intensive gas heating promotion ever sponsored by Consolidated Edison Company of New York, Inc., was started recently with a kick-off meeting in Manhattan for the company's sales representatives, local plumber-dealers, manufacturers and distributors of gas appliances. A similar meeting for operations in Westchester County, N. Y., was also held.

Goal of Con Edison's 1954 Gas Promotion is to vigorously promote the use of gas for space and water heating, for home and apartment laundry dryers and for apartment house incineration.

The campaign, which will run through November 15, will be supported by newspaper, television and radio advertising and four promotional mailings to potential gas heating customers in one and two-family homes throughout the company's gas service territory. Advertising and promotional efforts will stress the theme: Gas Heat's Best—Costs Less Than You Think.

Newspaper advertising, totaling more than 1,500 insertions over the seven-month period will utilize daily and weekly media in Westchester and sections of New York City. Television and radio advertising will be used and the campaign message also will be carried on truck posters and special displays in Con Edison district office showrooms and show windows.

The four mailings to potential residential customers were spaced to hit in late April, early May, and will be sent on or about September 3 and again just before October 1.

Approximately 60 Con Edison business representatives already have received special training and have been assigned exclusively to the gas heating promotion to develop new business in their territories and follow through on the progress of installations.

Houston Nat'l Sets 200,000th Meter

Houston Natural Gas Corp. recently passed another growth milestone in its 29-year history by installing its 200,000 gas meter in the town of Victoria, Tex.

In observance of the occasion, and as a means of honoring the home and family which received the record-setting meter, Houston Natural presented the family with a choice of one of four gas appliances and an automatic gas clothes dryer was selected.

Rockwell Enlarges Pa. Meter Shop

With the opening recently of Rockwell Manufacturing Company's new 19,000 sq. ft. addition to its gas meter plant in DuBois, Pa., the plant has become the nation's largest gas meter manufacturing center.

The expansion, built to house manufacturing facilities for the company's large-capacity industrial meters, is the second to be completed in the area since September, 1953.

The company also has reported that its new 116,000 sq. ft. air conditioned manufacturing plant at Sulphur Springs, Tex., has started production operations. Established to serve users of valves, meters and other products, the plant is now producing steel valves. Completed last Fall, it is one of the most modern in the South and Southwest and cost in excess of $1,000,000, exclusive of plant equipment.

P. E. W. Goodwin, Jr., has been appointed general manager in charge of operations at the Sulphur Springs plant.

Appalachian Short Course in August

Mark V. Burlingame, vice president in charge of operations, Natural Gas Pipe Line Company of America and Texas-Illinois Gas Pipe Line Co., will present the principal address at the Appalachian gas measurement short course scheduled for August 23-25 at West Virginia University, Morgantown, W. Va.

C. G. Moorhead

A. M. Hutchinson

C. G. Moorhead, measurement superintendent, Hope Natural Gas Co., is general chairman of the short course, and A. M. Hutchinson, measurement superintendent, Ohio Fuel Gas Co., is program committee chairman.

Subjects to be covered in this 14th annual short course will include fundamentals of gas measurement and special sessions on automatic control instruments, planning and design of installations, pressure regulators, orifice meters, large capacity meters, domestic meters, motor valves and auxiliary measurement instruments. Approximately 100 instructors have been chosen to teach the special phases of these subjects.

The short course is attended annually by measurement and control engineers and other technical personnel representing the petroleum, gas and chemical industries.

Lauderbaugh Is Assistant Vice Pres

A. B. Lauderbaugh has been named assistant vice president, Manufacturers Light and Heat Co. and other Pittsburgh Group affiliates of Columbia Gas System. A 26-year veteran of the Columbia system, he has been chief engineer of the companies since 1952.

Jones Is Fla-Ga Association Pres

Roy E. Jones, executive vice president, Peoples Water and Gas Co., has been elected president of Florida-Georgia Gas Association, at its annual meeting.

In the same election, Joseph Frink, Florida Power & Light Co., was elected secretary-treasurer.

PACIFIC NORTHWEST PIPELINE PROJECT OKAYED BY FPC

Natural gas for the Northwest states, Washington and Oregon, seemed a step closer to delivery by the unanimous mid-June decision of the Federal Power Commission to grant a certificate to Pacific Northwest Pipeline Corp. This project involves 1,466 miles of pipeline and related facilities, to be constructed at an initial cost of $160-millions. The gas would be transported from the San Juan Basin in New Mexico and from intermediate production areas to markets extending to Bellingham, Wenatchee and Spokane in Washington, and Portland, Ore. Two other laterals would reach Hanford and Walla Walla, Wash.

Coincident with the approval of the Pacific Northwest application, FPC approved a related project which includes a connecting pipeline to be built by Colorado Interstate Gas Company over a 365-mile route from Rock Springs, Wyo. to Denver. The Colorado Interstate project has an estimated cost of $23-millions.

Pacific Northwest Pipeline Corporation hopes to complete the construction job and deliver gas in the Washington-Oregon area by late-1955, according to C. R. Williams, president. Colorado Interstate is aiming at the same completion date.

Statements by Pacific Northwest executives point to anticipated 1st-year sales of 279 MMcf per day and 3d-year sales of 364.6 MMcf daily. The Colorado Interstate line will have an initial capacity of 118 MMcf per day and can carry an eventual capacity of 214 MMcf. The new construction by Colorado Interstate will increase its system sales capacity to 626 MMcf.

Markets for Pacific Northwest Pipeline in Washington include Bellingham, Anacortes, Everett, Seattle, Tacoma, Olympia, Centralia-Chehalis, Longview-Kelso, Camas-Washougal, Walla Walla, Spokane, Wenatchee, Yakima, Toppenish, Granger, Sunnyside, Grandview, Prosser, Kennewick, Pasco, Richland and Ellensburg. In Oregon: Portland, The Dalles, Pendleton, LaGrande, Baker, Milton-Freewater and Ontario.

H. Ward Cheeseman

H. Ward Cheeseman, senior sales engineer, The Sprague Meter Co., died May 8 at the age of 74.

Mr. Cheeseman was associated with Sprague Meter for 48 years, having started as a timekeeper in 1906, and later becoming foreman. During World War I, he acted as branch manager, Davenport, Ia., and covered the Eastern territory from Maine to Florida for nearly 30 years.

Mr. Cheeseman was one of the original 13 members of the Gild of Ancient Suppliers.

Paul F. Leary

Paul F. Leary, 62, superintendent of Portland Gas & Coke Co., Ore., died on June 4.

Mr. Leary joined the company in 1921 as an order clerk. He became supervisor of the contract bureau in 1937 and superintendent of the entire customer office in 1947.

Elect 3 Gas Machinery Co Execs

J. C. Calhoun, Jr., has been elected president by the board of directors, The Gas Machinery Co., and Robert Kyle and K. W. Stookey have been elected first and second vice presidents respectively. Mr. Calhoun, an attorney associated with the company for a number of years, previously was vice president and secretary.

J. C. Calhoun, Jr.

Mr. Kyle was sales manager for several years before his promotion and prior to joining the company was associated with General Controls Co., Iroquois Gas Corp., and the American Gas Association Laboratories.

Robert Kyle

K. W. Stookey

Mr. Stookey has been vice president, and earlier was construction superintendent.

The executive changes were made in the interest of broadening administrative management control and improving field sales service, the company announced.

Columbia Gas Meets Heating Demand

Families and industries seeking natural gas in the mid-Appalachian area served by Columbia Gas System can now be supplied, the company has announced. Restrictions of varying degree on natural gas spaceheating have been in effect in various parts of the System's territory since 1947, when demand for gas went beyond the System's ability to provide supplies.

Stuart M. Crocker, chairman of the board, said recently that Columbia is now able for all practical purposes to supply gas for spaceheating to all who want it. The chairman estimated that the System has a backlog of over 100,000 appliances for househeating.

Mr. Crocker pointed out that since 1946, Columbia's deliveries have more than doubled, rising from 234 billion cubic feet annually to 517 billion. As recently as 10 years ago, he added, Columbia's entire gas supply came from the Appalachian area, in which its markets are located. But demand so far outstripped this local supply source in recent years that now the System gets nearly 75% of its gas from the Southwest United States.

The improvement in gas supply is due primarily to two factors. One is the 375 MMcf of gas which will be available on a peak day from the System's own gas reserves in South Louisiana, soon to be transported for it by Gulf Interstate Gas Co., which will be ready to move gas by November. The other is the additional quantities which will be available from underground storage.

In order to receive and distribute the additional Gulf Interstate supplies, Mr. Crocker said, the System this year is planning a construction program of about $108,000,000—the largest in its history.

In meeting the demand for spaceheating, an important role has been played by Columbia's underground storage facilities. During the past heating season, on the System's peak demand day, nearly 50% of the deliveries came from underground storage.

The amount of gas Columbia had in storage at the year end has risen from 38 billion cubic feet in 1946 to 240 billion in 1953.

Fisher Governor Rep Adds New Engr

Lynn Maxwell has joined the sales engineering staff of Malcolm W. Black & Co., Inc., New York. He is specializing particularly on the regulator equipment of Fisher Governor Co., which the Black organization represents in the New York area. He will also handle Daniel orifice fittings, meter runs, Peerless scrubbers and odorizers, Continental butterfly valves, Coppus blowers and Garrett relief valves.

Lynn Maxwell

Mr. Maxwell, who received his mechanical engineering degree from Texas A. & M., has had experience as a construction engineer and design engineer; he holds an operating engineer's license, and for the past four years has been gas engineer for New Jersey Natural.

Papich Is AGA Safety Consultant

Rauel N. Papich, formerly field representative for safety services with American Red Cross has been appointed safety consultant of American Gas Association, succeeding William H. Adams, who has retired.

Mr. Papich joined the national staff of American Red Cross in 1942 as field representative. In 1945 he was assigned to duty in Europe by the National Red Cross as field representative for safety services.

In his capacity as safety consultant for AGA, he will bring to gas utility companies a knowledge of safety and accident prevention practices. He will serve as secretary of the AGA accident prevention committee of which Leo Nuhfer, The Peoples Natural Gas Co., Pittsburgh, is now chairman.

Rose Is Sec of AGA Mgmt Section

Harrington A. Rose, gas engineer for Stone & Webster Service Corp., has been named secretary of the general management section of American Gas Association. Bruce A. McCandless has relinquished the post of acting secretary of the general management section in order to devote full time to his administrative duties as assistant to the managing director.

New Consolidated Gas Utilities Pres

The board of directors of Consolidated Gas Utilities Corp., Okla., has announced that Norman Hirschfield resigned as president of the company and that Richard W. Camp, vice-president since 1946, has been elected to the position of president. Curtis B. Day, who has served as general manager in charge of operations, has been elevated to vice-president.

Elect Mid-West Gas Assn Officers

At the 49th annual meeting and convention of Mid-West Gas Association, held recently in Des Moines, Ia., the following officers were elected for the year 1954-55:

M. B. Cunningham, Iowa Power & Light Co., president; M. K. Wrench, Metropolitan Utilities District, Omaha, Neb., 1st vice president; George B. Johnson, Minneapolis Gas Co., 2nd vice president; and Harold E. Peckham, Northern States Power Co., St. Paul, Minn., secretary-treasurer.

Kopecki Named Selas Corp PR Mgr

Selas Corporation of America, Philadelphia, has appointed Ernest S. Kopecki manager of public relations and promotion. Mr. Kopecki has been associated with Carborundum Co. for the past several years as assistant to the manager of public relations. Previously, he served as sales and sales service representative and later, as assistant manager of public relations at Pennsylvania Salt Manufacturing Co.

Ernest S. Kopecki

Following separation from service with the U.S. Navy's Bureau of Ordnance, in 1945, as a Lieutenant Commander, Mr. Kopecki joined the staff of *Iron Age*, where he subsequently assumed the position of metallurgical editor.

Foxboro Co to Build Calif Factory

Ground has been broken for a new branch factory to be erected at San Leandro, Calif., by The Foxboro Co., Foxboro, Mass., manufacturer of industrial instruments for process measurement and control. Scheduled for completion by Aug. 15, the new 8,400 square feet building will more than double the production area of the present San Francisco shop and provide increased facilities for the manufacture, sales and service of instruments and accessories.

Drevs Is Sec of Peoples Gas L&C

Robert M. Drevs has been elected secretary of The Peoples Gas Light and Coke Company. Mr. Drevs, who has been with the company since 1933, has served as assistant secretary and assistant treasurer since 1949. He succeeds, as secretary, Remick McDowell who has also been a vice president since 1951.

Succeeding Mr. Drevs as assistant secretary and assistant treasurer is William H. Hollweg, former budget director. Other appointments are William E. Sauer as budget director and Thomas L. Malzacher as assistant budget director.

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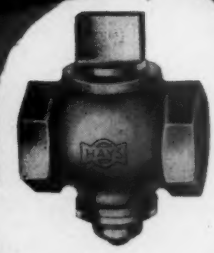
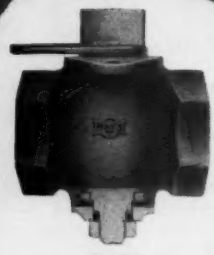
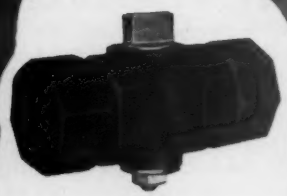
IT PAYS TO BUY HAYS®



7405
Iron Body, Galvanized,
Bronze Plug Stop



7490
"Key-Lok" Tamper Proof Stop
Lockwing—Iron Body,
Bronze Plug



7500
Threadless Gas Stop
Iron Body, Brass Plug

Service Line Stops—Meter Stops
Appliance Stops

Tamper Proof and Standard Patterns

Iron Body with Brass Plug
Black or Galvanized
Also All Brass Stops

Flat Head—Flat Head with Lockwing

Full Range of Sizes

Quality Assured . . .
By Precision Machining—
Individual Testing—
Rigid Inspection

Quality Proven . . .
By Supplying the Gas Industry
for Over 80 Years

Standard Packaging for Easy Handling,
Space Saving Storage . . . Another HAYS First

Write for literature, or ask "The Man from Hays"

HAYS
GAS SERVICE PRODUCTS
HAYS MANUFACTURING CO.
ERIE, PA.

NORTHERN NATURAL

Continued from page 15

benefit from this campaign, the company used three devices to further emphasize the kick-off of the program.

1. Key executives among Northern's utility customers were notified in advance and were supplied a tearsheet of a full page newspaper advertisement which described the program in detail.
2. This same tearsheet was mailed to the 13,000 names on the mailing list for Northern's quarterly external magazine, *Transmission*. This mailing list includes many of the top executives and business leaders in the Northern Plains.
3. The full page newspaper advertisement, mentioned above, which highlighted the national advertising program, was printed in advance in the 8 key cities in the Northern Plains—Minneapolis, St. Paul, Sioux City, Sioux Falls, Des Moines, Omaha, Council Bluffs and Lincoln.

Response favorable

Although it is too early to judge the effect of the program in terms of what industry might actually be drawn into the area as a result of the advertisements, it can now clearly be seen that the venture was an immediate success from a public relations standpoint.

In the few weeks since the first advertisement was printed, hundreds of letters have been received commending Northern for having instituted such a program. Company officials found it gratifying, too, that the response came from persons in a variety of businesses, professions and industries. Letters were received from bank presidents, radio stations, newspapers, manufacturing firms, railroads, chambers of commerce and many other organizations.

Typical of the highly favorable comments was this one of a Northern Plains executive who wrote, "Your ad is certainly one of the most effective presentations I have ever seen covering this general area."

In another letter, a bank president wrote, "It was thoughtful of you to send me advance copies of the ads which your company will run in *Time* and *Business Week*. Not only will this undoubtedly be of benefit to your own organization, but all of us in the area should ultimately realize considerable good. Obviously we should all work together for the development of the area and your advertising program is certainly a very tangible effort in this direction."

While this is Northern's first step in carrying its area development work to a national scale, it is reasonably safe to assume that with the initial wave of favorable reaction and with John Merriam's consistent enthusiasm for industrial development work, Northern Natural is in the field of area development to stay.

DuVal Retires from Pacific G&E

The retirement of Ralph W. DuVal, rate attorney of Pacific Gas and Electric Co., and the promotion of Frederick T. Searls to the position were announced recently by the company. Mr. DuVal will become special attorney of P.G. and E. He is a veteran of 41 years' service with the company.

MEN AT WORK

LAVERNA BEST was appointed home service director, *Houston Natural Gas System.*

W. M. BLACK has been named consulting appraisal engineer, *Ebasco Services Inc.*

A. C. BOYER is assistant superintendent—production and transmission, *The Peoples Natural Gas Co.*

GEORGE W. BRISBIN will direct gas operations, Northern div., *The Peoples Natural Gas Co.*

C. W. CULLEN is temporarily supervisor of sales, Western div., *The Peoples Natural Gas Co.*

H. A. DENNY is now vice president and assistant general manager, engineering and construction div., *Koppers Co., Inc.*

ROBERT EASTERLY has been assigned as representative, Chicago office, *Ebasco Services Inc.*

CHARLES C. EELES, Toledo district industrial and commercial sales manager, is now in Columbus general office, *Ohio Fuel Gas Co.*

HOWARD B. EVERETT was promoted to manager of personnel, *Southern Counties Gas Co.*

A. B. FISHER, JR., was named general superintendent of construction, engineering and construction div., *Koppers Co., Inc.*

BERNARD E. GALLAGHER was appointed assistant to president, *Consolidated Edison Company of New York, Inc.*

HAROLD E. GREENE is now Altoona manager, *The Peoples Natural Gas Co.*

RUSSELL A. HALL is now supervisor of sales, Southern div., *The Peoples Natural Gas Co.*

WARREN E. HAUGHT will supervise sales, Northern div., *The Peoples Natural Gas Co.*

HOWARD M. JOINER is now chief engineer, *The Peoples Natural Gas Co.*

GEORGE K. KLINE is now head of the Western div., *The Peoples Natural Gas Co.*

A. F. KRAUS has been promoted to assistant chief engineer, *The Peoples Natural Gas Co.*

WALTER LOWE is now supervisor of sales, Central div., *The Peoples Natural Gas Co.*

DANIEL F. MALLOY has been appointed Southern California representative, *American Gas Furnace Co.*

JOSEPH S. MCAVOY has been made local manager, Johnstown, *The Peoples Natural Gas Co.*

ROY K. MCDANIEL is now supervisor of sales, Eastern div., *The Peoples Natural Gas Co.*

COLIN U. MILLER has been made manager, Eastern div., *The Peoples Natural Gas Co.*

JOSEPH R. PHILIPS is now district engineer, *The Peoples Natural Gas Co.*

RALPH W. POWELL is now responsible for operations, Southern div., *The Peoples Natural Gas Co.*

JOHN J. REILLY has been appointed chief appraisal engineer, *Ebasco Services Inc.*

W. F. ROSS is now on sales engineering staff, J. E. Von Maur Co., Ohio representative, *American Gas Furnace Co.*

CARL W. SHUPP was named superintendent of distribution, Central div., *Southern California Gas Co.*

WILLIAM F. SPENCER was promoted to assistant chief engineer, *The Peoples Natural Gas Co.*

WILLIAM J. THOMPSON has been named office manager, Altoona, *The Peoples Natural Gas Co.*

RICHARD W. VOLLMER is now manager, chemical and gas dep't., engineering and construction div., *Koppers Co., Inc.*

GEORGE P. WILSON is now production manager, construction and engineering div., *Koppers Co., Inc.*

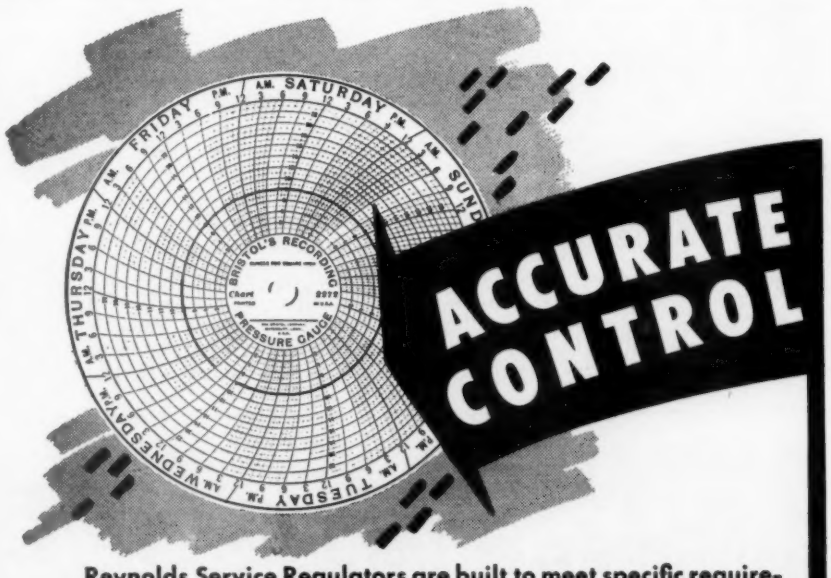
RONALD WILSON was appointed office manager, Johnstown, *The Peoples Natural Gas Co.*

DAVID E. YOUNG was promoted to assistant district manager, Toledo, *Ohio Fuel Gas Co.*

Hoots Is AGA Rate Com Vice-Chm

Paul F. Hoots, assistant to the president, New Orleans Public Service, Inc., has been appointed vice-chairman of the American Gas Association rate committee. Mr. Hoots will aid George A. Morgan, The Peoples Gas Light and Coke Co., Chicago, chairman of the committee, in conducting the operation of the committee.

Mr. Hoots, in 1919, joined New Orleans Railway and Light Co., predecessor of New Orleans Public Service, as a chemist. Subsequently he served as chemist and test engineer, assistant chief engineer, research engineer and chief engineer. In 1939 he was appointed assistant to president, the position he now holds.



Reynolds Service Regulators are built to meet specific requirements—years of operation in the field through a complete range of operating conditions have proved not only their superiority but their durability. With parts so precisely machined for each model that they are completely interchangeable. The accuracy you require in performance is assured.

MODEL 10

Dead Weight or Spring Type, with or without Mercury Seal, or Dead Weight Safety Seal or diaphragm operated relief valve. All working parts are so accessible as to be interchangeable without removal from pipe line.

MODEL 20

Dead Weight or Spring Type, with or without Mercury Seal, or Dead Weight Safety Seal or diaphragm operated relief valve. All working parts are so accurate as to permit complete interchangeability in shop.

MODEL 30

For horizontal or vertical connections, with or without removable valve pocket. Available with either Spring or Dead Weight adjustment. With or without Mercury or Dead Weight Safety Seal or diaphragm operated relief valve.

Reynolds Gas Regulator Co.
ANDERSON, INDIANA, U. S. A.
GAS CONTROL SINCE 1892

PHILLIPS CASE

Continued from page 14

past decisions of the Supreme Court to find that FPC does have jurisdiction to regulate the sales of natural gas in interstate commerce. It is interesting to note that while the legislative history swayed Justice Minton, it was found inconclusive by Douglas, and found by Clark to support his view that FPC does not have jurisdiction. This difference among the justices is quite in keeping with the bafflement the industry has suffered throughout the years of conflicting, contradictory and inconclusive rulings of the courts and the agency.

The main contradiction is found in the language of the statute itself. Section 1(b), on the one hand, says that the Act shall apply to the sale in interstate commerce of natural gas for ultimate public consumption and, on the other hand, goes ahead to say its provisions shall not apply to the production or gathering of natural gas. The independent producers and FPC had argued that Phillips' operations were solely production and gathering, while the Court found they were part of sales in interstate commerce. But, regardless of past arguments over the meaning of the statutory words, the matter is now settled and the Court has decreed that Section 1(b) does permit FPC to regulate.

The major judicial decision relied on by Justice Minton, the well-known ruling in *Interstate Natural Gas Co. v. FPC*, 331 U.S. 682, decided in 1947, was the same stumbling block for the industry that it was in the decision below, when the U. S. Court of Appeals reversed FPC and found that there was jurisdiction. As admitted by Justice Clark in his dissent, there was language in the Interstate decision that went a long way toward upholding Federal jurisdiction. In Interstate, the Court had already found that the Act applied, with the distinguishing factor being that Interstate operated both pipeline and production-gathering facilities, and commingled the gas on its way to the interstate commerce stream. This latter fact caused Justices Clark and Douglas to declare the Interstate case as not controlling in their dissents.

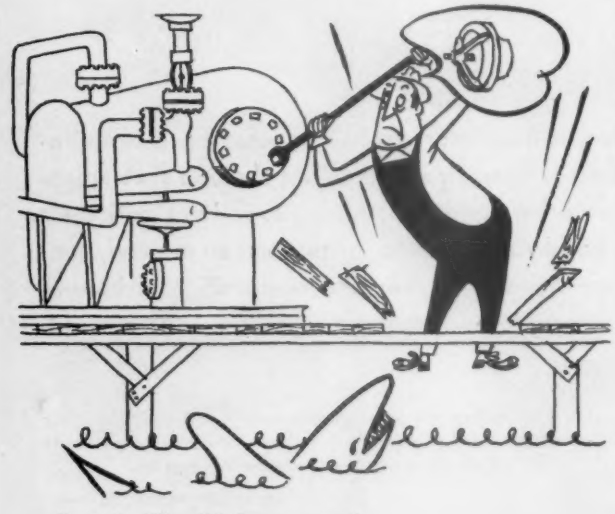
Indirectly, it was the Interstate decision that brought on the Phillips proceeding. After Interstate came down, FPC changed its position and decided it should investigate to determine if it did have jurisdiction to regulate the independents. Thereupon, it began the investigation into the operations of Phillips that culminated in the present ruling, although it was not until 1951 that FPC made its finding in the Phillips case. In that ruling, the Commission changed its mind again, by holding that it did not have jurisdiction.

Other influences

Other events occurred after the Interstate ruling that influenced the Supreme Court in its decision. When FPC indicated that it might take jurisdiction, Congressional action was begun to clear up the confusion in Section 1(b) of the Natural Gas Act. This finally brought the passage of the Kerr Bill in 1950, which would have definitely exempted the independent producers from Federal regulation. The Kerr Bill was vetoed by former President Truman and of course, never became law. Justice Minton wound up his opinion by saying, "Attempts to weaken this protection by amendatory legislation exempting independent natural-gas producers from Federal regulation have repeatedly failed, and we refuse to achieve the same result by a strained interpretation of the existing statutory language." Thus, the failure of the Kerr Bill to become law and clear up the confusion was a later strike against the industry when the Supreme Court finally passed on the meaning of Section 1(b).

The dissenting opinion of Justice Douglas admitted the doubts on both sides as to the meaning of the Act. Douglas said the Court must make a choice between the seemingly-contradictory terms of Section 1(b) and, for him, the choice was not easy. But Douglas said regulation of Phillips' sales must necessarily mean that Federal supervision would have to extend over production and gathering, and this was expressly forbidden in the Act. Because of the past confusion, the question should be settled in Congress, not in the courts, according to Douglas.

The Justice also pointed out that the effect of the Court's decision on the industry would be profound. By regulating sales, FPC would be regulating profits, and prof-



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its of Phillips and "all the other gatherers, whose gas moves into the interstate pipelines, have profound effects on the rate of production, the methods of production, the old wells that are continued in production, the new ones explored, etc. Regulating the price at which the independent producer can sell his gas regulates his business in the most vital way any business can be regulated. That regulation largely nullifies the exemption granted by Congress."

The dissenting opinion of Justice Clark also emphasized that the Court's ruling meant regulation of producing and gathering. Clark angrily wrote, "By today's decision, the Court restricts the phrase 'production and gathering' to 'the physical activities, facilities, and properties' used in production and gathering.' Such a gloss strips the words of their substance. If the Congress so intended, then it left for state regulation only a mass of empty pipe, vacant processing plants and thousands of hollow wells with scarecrow derricks, monuments to this new extension of Federal power."

Effects on state laws

Where does the Court's ruling leave state regulation? As pointed out in Clark's dissent, the states have been, for more than 35 years, and are now enforcing regulatory laws covering production and gathering, including pricing, proration of gas, ratable taking, unitization of fields, processing of casinghead gas including priority over other gases, well spacing, repressuring, abandonment of wells, marginal area development, and other devices. And already the Supreme Court has upheld the power of the states to regulate minimum well-head prices as a conservation measure, in *Cities Service Gas Co. v. Peerless Oil & Gas Co.*, 340 U.S. 179 (1950), *Phillips Petroleum Co. v. Oklahoma*, 340 U.S. 190 (1950).

Thus, possible conflicts in state regulation and Federal regulation at the price level might follow. In that event, Federal supremacy would take charge and any FPC ruling in conflict with a state finding would eliminate the state decision. But as a practical matter, this hardly seems likely to occur in the near future.

Otherwise, where does the Supreme Court decision leave the industry? The announced intention of Phillips and some of the producing states to ask the high court to reconsider its opinion cannot be taken too hopefully by lawyers. The Supreme Court almost never grants a rehearing of a case once it has made its decision, although the Court has already reversed itself once in this same Phillips case. After the U.S. Court of Appeals had made its decision last year, Phillips, FPC and some states petitioned the Supreme Court to hear and decide the case. The Court, in a stunning move, refused to even hear the matter. Phillips then petitioned for rehearing, the Court studied the matter again, and decided to hear the case. From there is was presented, argued and decided. However, any petition for rehearing now cannot be decided until October when the Court convenes for its new term.

Should that petition be denied, then this decision is Federal regulation until Congress changes the law.

PARKER

Continued from page 29

chandise having marks or names likely to deceive the buying public. Unfair competition laws restrain methods of unfair competition, if a name or mark on merchandise is not involved. All of these laws and regulations relate to interstate commerce transactions although, of course, various states have enacted similar laws regulating intrastate transactions.

It is true that a purchaser, such as a gas company, which unfortunately purchases goods which are unlawful to sell, under these various laws, can do nothing but keep them or destroy them in accordance with government orders. In other words, the retailer or wholesaler is loser.

The courts hold that a trademark gives its owner only the right to prohibit its use by others, to protect his good will. Hence, when a mark is used in a way that does not deceive the public, it is legal.

In Champion Co. v. Sanders, 67 S. Ct. 1136, the U. S. Supreme Court decided that a company which reconditions second-hand merchandise and accessories may, with restrictions, use the original trademark.

In this case the court held that a reconditioning company can recondition old merchandise and retain its original trademark, but the company must stamp such merchandise to show it has been reconditioned.

This court held that the reconditioning company will be guilty of unfair competition and infringement if it fails to have the word "repaired" or "used" stamped and baked on the merchandise. The court said:

"We are dealing here with second-hand goods. . . . Here there has been no showing of fraud or palming off. . . . Inferiority is immaterial so long as the article is clearly and distinctively sold as repaired or reconditioned rather than as new."

But, if a gas company purchases reconditioned merchandise not properly stamped, it cannot dispose of such merchandise without liability to the owner of the trademark.

Saunders Named Texas Eastern VP

J. B. Saunders, Jr., president of Triangle Refineries, Inc., has been elected vice-president of Texas Eastern Transmission Corp.

Mr. Saunders has been active in the oil business since 1922. Originally with the Kettle Creek Refining Co. in Arkansas, he became sales manager in 1928. In 1929 he was made general sales manager for Imperial Refineries of Tulsa, Okla. In 1937 Mr. Saunders organized Triangle Refineries, Inc.

Cushman Transfers to AGA PR Post

Jac A. Cushman has transferred to the AGA Public Information Bureau to assist James M. Beall, director of public information, in the Association's public relations activities.

Prior to his new assignment, Mr. Cushman edited *American Gas Association Monthly*. He has been succeeded in that position by Vaughn O'Brien, formerly editor of *Gas Appliance Merchandising*.

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AGA Home Service Contest Advances

The American Gas Association Home Service Achievement Award contest sponsored by McCall's magazine, announced some time ago, has been progressing steadily according to AGA.

The contest, which closes July 31, may be entered by home service directors and individual members of home service departments of utility companies which are members of AGA. The awards will be made to the home service department for achievement in the area served by the company, and to those individuals whose ideas make the greatest contribution to the advancement of modern home-making by promoting interest in, and better use of, gas and modern gas equipment in the home.

Awards will be presented to the winners at the annual convention of AGA, to be held in Atlantic City, N. J., Oct. 11 to 13.

Open Ebasco Services Dallas Office

Ebasco Services Inc. has opened an office in the Southland Life Building, Dallas, Tex. The Dallas office has been opened to acquaint new clients and prospects with the services Ebasco offers business and industry, and to facilitate closer relations between the Ebasco staff and its clients in the southwestern area. The office will be managed by W. A. Buchanan.

Blaw-Knox Names Southern Div Rep

Frank A. Weil has been appointed southern representative for Blaw-Knox Company's Chemical Plants and Buflovak Equipment divisions. He will be located in the Birmingham office and will serve Alabama, Florida, Georgia, Mississippi, and South Carolina.

Mr. Weil has been with the Chemical Plants division for seven years as principal process and supervisory process engineer.

Microwave at Colorado Interstate

A microwave system between the general offices of Colorado Interstate Gas Co. and some of its outlying compressor station locations now is in operation. The microwave network covers a total of 231 miles. It is designed to carry 24 voice channels.

Although the average hop for a microwave beam is approximately 25 miles, the Colorado Interstate system boasts one jump of 81.5 miles from Cheyenne Mountain. The terrain and high points in this area are responsible for the extraordinary size of the hops in this system.

The company also uses private telephone, commercial telephone, teletype and Western Union facilities.

Ordinary interference suffered in tele-

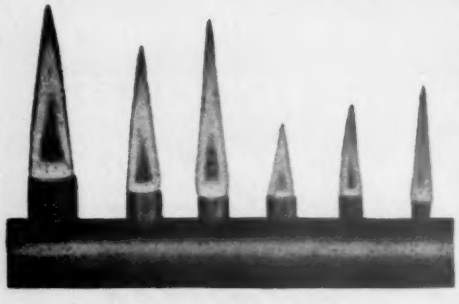
Period	Days/yr.	Max.	Aver.	Per yr.	¢/Mcf	Cost/yr.
A	258	42	42	10,836	14.2	$1,538.71
B	60	73.3	54	3,240	29.6	959.04
C	10	84.3	78.3	783	38.1	298.32
D	9	96.8	90	810	64.8	524.88
E_2	4	109.4	102	408	70	285.60
E_4	3	122.0	115	445	73	324.85
Repairs, etc.	21	—	—	—	—	—
Totals	365			16,522		$3,931.40

Average cost of gas S ¢/Mcf = 23.75¢/Mcf.

Natural gas costs, based on typical rates for New England would be:

Demand charge—$4.50/month/Mcf of maximum demand load— 4.50 × 12 × 90	$ 4,860	
Commodity charge—30¢/Mcf—36,500 — 16,522 = 19,978 × 0.30	5,993	
Total	$10,853	
Average cost natural gas, 54.4¢/Mcf Total cost per year 100 Mcf/day of average daily sendout =	$14,784	
Total cost of all gas per Mcf		40.4¢

MACHLET TIPS
(Tip Burners)
by
AGF



GIVE ROUND BLAST and SOFT FOCUS

ROUND BLAST TYPE
For intense flame from a slow burning natural or re-formed gas, Round Blast Type Machlet Tips are perfect. When mounted in suitable manifolds they are used for heating work in continuous soft and silver soldering machines, also for batch type soldering set-ups.

Many small precision parts give these burners wide turn down range and adjustment from mild focus to hard blast.

SOFT FOCUS TYPE
For relatively low temperatures where intensity and localization of heat are undesirable Soft Focus Machlet Tips are most suitable.

When mounted in manifolds these tips are commonly used for heating tempering plates, tanks, pans, etc.

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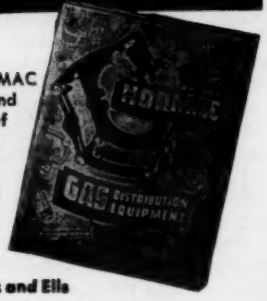

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phonic communications is avoided by use of a microwave system, William I. Blount, in charge of Colorado Interstate's communications, noted.

Equipment for the system was manufactured by Radio Corporation of America.

STARK

Continued from page 18

These are the maximum loads for each period:

Period	Gas S	Natural Gas	Total
A	42	up to 90	up to 132
B	73.3	90	163.3
C	84.3	90	174.3
D	96.8	90	186.8
E_2	109.4	90	199.4
E_4 or O ..	122	90	212

The cost of gas, when applying this process, will be as shown in the table on page 36, for 100 Mcf of daily average load.

An example from a New England gas utility with 10,000 Mcf average load per day. The average yearly cost of gas, including natural gas and peakload gas (oil gas 5% and propane 3% of yearly sendout), will be of the order of 58¢/Mcf. If the new process described in this article is applied, the average cost will be 40.4¢/Mcf, a saving of approximately 30%. The saving may represent $660,000 per year, which would permit plant amortization in less than 3 years.

We have given above a typical example for the application of our process for natural gas peakload coverage. However, a study has to be made for each case considering the local conditions. By taking the average day load during the year for a specific case, all capacity and load conditions (for similar DD) can be obtained from the above, taking as comparison 100 as per curve L. If a plant has selected 5000 Mcf/d (average day load) then the oil gas and extraction plant capacity will be (1.25 × 5000) *6250* Mcf/d; the demand charge for natural gas (0.9 × 5000) *4500* Mcf/d; the load during A period (0.4 × 5000) *2100* Mcf/d, etc. The cost of substitute gas per Mcf will be the *same* except for the depreciation cost which has to be adjusted for the plant size as compared with 8¢/Mcf of oil gas considered in the example for a typical plant of 10,000 Mcf/d average load.

This process can also be applied when natural gas is not available for gas utilities or industries. Assuming that a gas of 550 Btu/cf is desired, the restgas (736 Btu/cf, 0.58 gravity) can either be diluted with air to (550 Btu/cf, gravity 0.76) or with reformed C-2 cut (550 Btu/cf, gravity 0.5). If a gas of 736 Btu/cf is satisfactory then the restgas can be used as such. The cost of substitute gas may arrive at approximately ½ of the cost of carburetted water gas. If the process is applied to produce continuously the same output in gas, for instance industry, then the cost of the gas produced may be less than the cost of natural gas in Texas depending on local conditions.

Summary

Advantages of this process for producing substitute gas can be summarized:

1. The cost of substitute gas will be approximately half of natural gas cost. The total cost of gas may be reduced by about 30%, allowing for the amortization of the plant in 2-to-3 years.
2. The substitute gas has a lower gravity than oil gas or propane-air and is closer to natural gas. It avoids increase in heat content of substitute gas.
3. Cleaner substitute gas, free of organic sulphur or condensables.
4. The plant is very flexible.
5. Allows a reduction in the demand charge of natural gas and avoids penalties for minimum charge.
6. It can represent a 100% standby for natural gas, even for emergencies of total shut off during heaviest peakload.
7. It provides specialized personnel at all times and equipment ready for standby.
8. The hydrogen introduced continuously in the mixture will improve the burning characteristics of natural gas.
9. The heat content of sendout gas can be corrected to 1,000 Btu/cf and saving made for the heat content of natural gas if in excess of above.
10. Saving in compression costs in cases where substitute gas is required at higher pressures.

. . . then I suggested to the boss we change to

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NEW BULLETINS

MINNEAPOLIS-HONEYWELL FLOW METERS. This new bulletin describes all types of flow meters made by the manufacturer, and it includes indicating, recording, integrating and controlling instruments of both evenly graduated and square root types, as well as area meters and differential converters. Also included in the bulletin is a section on flow approximation and installation information. The bulletin contains photographs, various charts and tables, and general dimensions.

Bulletin Catalog 2320. Pp. 56. Minneapolis-Honeywell Regulator Co., Industrial Div., Wayne and Windrim Avenues, Philadelphia 44, Pa.

LUNKENHEIMER GROOVED END VALVES. This new bulletin describes the company's iron body bronze mounted grooved end valves for grooved end couplings. The valves are available in 2½" to 8" sizes in standard 200-lb. w.o.g. gate valve patterns and in a 2" size 225-lb. w.o.g. pattern.

Bulletin No. 503, 10M. Pp. 4. The Lunkenheimer Co., Box 360, Cincinnati 14, O.

WORTHINGTON ENGINES. This revised bulletin on the company's diesel, dual fuel and gas engines gives available engine types, horse power ratings, and plant auxiliaries, as well as the numerous applications possible for the various engine types. Illustrated from cover to cover, the bulletin shows applications in municipal power plants, gas distribution and pipeline stations; applications in the gas, chemical, refinery, mining, refrigeration and air conditioning fields; and applications for numerous other services.

Bulletin S-500-B13C. Pp. 44. Advertising Dep't., Worthington Corp., Harrison, N. J.

SINGLE STAGE ROTARY COMPRESSORS—VACUUM PUMPS. The operation and construction of the company's single-stage water-cooled rotary compressors and vacuum pumps applicable to every air or gas handling requirement are described in this new bulletin. It gives general specifications for the units along with typical air piping arrangement diagrams and proper accessories designed for gaining the most satisfactory results.

Bulletin 16B8126. Pp. 12. Allis-Chalmers Manufacturing Co., Milwaukee, Wis.

VIBROGROUND SOIL RESISTIVITY METER. This new bulletin describes the construction, operation and application of the manufacturer's new model soil resistivity meter. Available with a scale calibrated to read directly soil resistivity up to 30,000 ohm-cm, the instrument weighs 9½ lbs. and measures 9" by 6" by 6½". The meter is said to be accurate to 2% of full scale.

Bulletin 105A. Pp. 2. Associated Research, Inc., 3758 W. Belmont Ave., Chicago, Ill.

POWERMASTER PACKAGED AUTOMATIC BOILERS. The manufacturer's new line of packaged automatic boilers, for firing light oil or gas, is described in this new bulletin. The bulletin reports that for gas firing a specially designed pre-mixing gas burner is utilized. Combination units adaptable to firing either gas or oil may be obtained. The new unit is built in nine sizes from 15 hp through 100 hp, covering steam requirements to about 3,450 lb/hr as well as hot water designs. Details of design and construction, cut-away view, and sample specifications are contained in the bulletin.

Bulletin 1230 Model 4 Powermaster. Pp. 8. Orr & Sembower, Inc., Reading, Pa.

MINNEAPOLIS-HONEYWELL COMPOSITE CATALOG. This new bulletin contains descriptions of the principal types of the manufacturer's industrial instruments and equipment. Each description includes a reference to more detailed literature, which may be obtained from the company. The bulletin offers information on the company's pyrometers, potentiometers, temperature detectors, thermometers, pressure gages, flow and liquid level meters, panelboards and related instruments, valves, switches, starters, contractors and relays, among other instruments.

Bulletin Catalog 5001. Pp. 24. Minneapolis-Honeywell Regulator Co., Industrial Div., Wayne and Windrim Avenues, Philadelphia 44, Pa.

TYPE JS DIESEL, GAS DIESEL, GAS ENGINES. This new bulletin describes the manufacturer's atmospheric and supercharged, vertical four cycle, 5, 6, 7 and 8 cylinder diesel, gas diesel and gas engines. Pictures of various units are presented in the bulletin along with information on standard equipment, specifications, weights and shipping information, and photographs of standard installations. The bulletin presents schematic and cross-section illustrations for atmospheric and supercharged engines.

Bulletin No. J-73. Pp. 16. The Cooper-Bessemer Corp., Mount Vernon, O.

THE KOPPERS-HASCHE REFORMER. Details of a reforming process for producing interchangeable gases are contained in this new bulletin describing the company's reforming furnace. Generously illustrated, the informative bulletin contains a description of the reforming process, listing many of the advantages to be found in the company's reformer, and presents a colorful flow diagram. Photographs of various installations are shown.

Bulletin E-30. Pp. 12. Koppers Co., Inc., Engineering and Construction Dep't., Pittsburgh 19.

ECLIPSE SERIES PBO TUNNEL BURNERS. The tunnel burners described in this new bulletin are for burning complete gas/air mixtures and are made in three sizes; 4", 5" and 6" with flanged connections. Each size can be supplied with various nozzle drillings. The bulletin presents dimensions and capacities, suggested assemblies and a section on combustion accessories.

Bulletin H-65. Pp. 4. Eclipse Fuel Engineering Co., 1001 Buchanan St., Rockford, Ill.

HAUCK VARI-PRESSURE BURNERS. The manufacturer's new line of vari-pressure low pressure air type burners, for either oil or combination oil and gas, is described in this bulletin. The burners are intended for multiple burnered furnaces, ovens or kilns, where a group of burners are to be

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operated from one point to ratio and control the capacity of air and fuel by means of varying the pressures. The bulletin reports that an unusual advantage of the series of burners is that the flame can be easily changed from a short bushy shape to a long narrow type, or intermediate points, by merely setting the flame adjusting lever. The lever has an indicator dial and a locknut.

Bulletin Catalog No. 413. Pp. 4. Hauck Manufacturing Co., 124-136 Tenth St., Brooklyn 15, N. Y.

CLEAVER-BROOKS SMALL BOILERS. Introducing the manufacturer's new line of small boilers, this bulletin completely describes the boilers which are available in 15 to 40 hp for heating and processing. Completely illustrated, the bulletin stresses these five advantages: silent operation, fuel economy, electric combustion safety control, accessibility for operation and maintenance, and quick changeover of fuels on gas/oil combination units. Also illustrated and explained are the new hinged front and rear doors, forced draft air system, four pass construction and electric control panel. Included are drawings and specifications.

Bulletin AD-134. Pp. 4. Cleaver-Brooks Co., 326 E. Keefe Ave., Milwaukee 12, Wis.

MINNEAPOLIS-HONEYWELL INSTRUMENTATION FOR STEAM GENERATION. This new bulletin on instrumentation for steam generation is a convenient, one source reference for all of the company's products applicable to steam generation. Among other subjects, the bulletin presents sections devoted to flow, liquid level, temperature, pressure, pneumatic transmission, indicators, recorders, controllers, reset alarms, valves and conductivity.

Bulletin 9050. Pp. 28. Minneapolis-Honeywell Regulator Co., Industrial Div., Wayne and Windrim Avenues, Philadelphia 44, Pa.

ALEMITE LUBRICATION EQUIPMENT FOR LUBRICATED VALVES. This new bulletin is a catalog of lubrication equipment especially designed for the servicing of lubricated valves. The bulletin points out that high pressure mechanical lubrication eliminates removing, replacing and turning lubricant screws generally found on lubricated valves. High pressure forces lubricant through all valve lube ports, regardless of back pressure, because lubricant is injected into valve direct from a gun or pump.

Bulletin Catalog No. 22-170. Pp. 8. Alemite Div., Stewart-Warner Corp., 1826 Diversey Parkway, Chicago 14, Ill.

ECLIPSE BURMIX BURNERS. This new bulletin offers information on the company's burners for low pressure gas and air. The unit is a combination blast burner and proportional gas-air mixing assembly. The bulletin reports that the burner makes a particularly suitable unit for converting oil-fired equipment to gas heating. In addition to photographs of the various burners, there is a capacity and selection table for the units, and dimension and specification tables.

Bulletin H-29. Pp. 4. Eclipse Fuel Engineering Co., Rockford, Ill.

TEMPERATURE INDICATIONS. A thermo-electric pyrometer for temperature measurement beyond 1,000°F is described in this new bulletin. The bulletin presents information on pertinent facts about pyrometry in general industry, and discusses advantages of a pyrometer over other less sensitive temperature indicators.

Bulletin 4371. Pp. 4. Illinois Testing Laboratories, Inc., 420 No. LaSalle St., Chicago 10, Ill.

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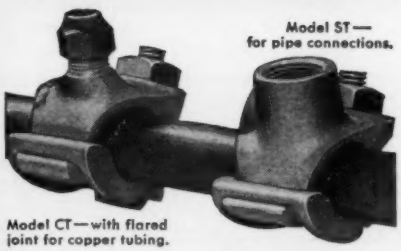

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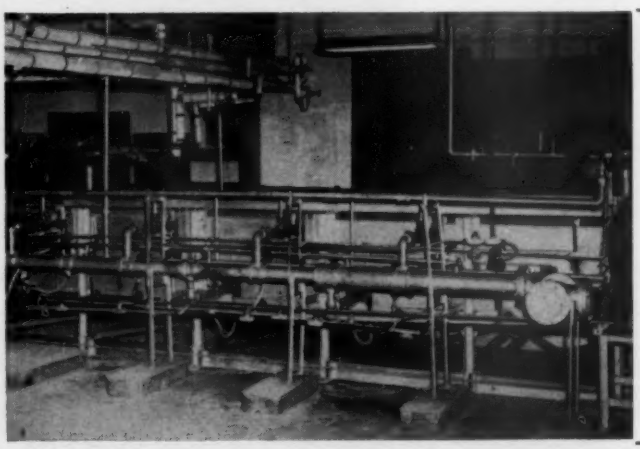

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GAS INDUSTRY CALENDAR

July

12-16 National housewares and home appliance exhibits, Auditorium, Atlantic City, N. J.
16 AGA board of directors, Biltmore Hotel, New York.
19-23 Western summer radio-television and appliance market, Western Merchandise Mart, San Francisco.

August

23-25 Appalachian gas measurement short course, West Virginia University, Morgantown, W. Va.

September

8-10 Pacific Coast Gas Association, Vancouver and Georgia Hotels, Vancouver, British Columbia.
8-10 Mid-West gas school and conference, Iowa State College, Ames, Iowa.
8-11 AGA operating section, organization meetings, Hotel New Yorker, New York.
10 New Jersey Gas Association, Hotel Monmouth, Spring Lake, N. J.
13-14 Independent Natural Gas Association of America, annual meeting, Roosevelt Hotel, New Orleans, La.
17-18 Maryland Utilities Association, fall conference, Virginia Beach, Va.
24 Oklahoma Utilities Association, gas division meeting, Biltmore Hotel, Oklahoma City, Okla.
28-29 Texas Mid-Continent Oil and Gas Association, Baker Hotel, Dallas.

October

9 AGA board of directors, Atlantic City, N. J.
11-13 AGA annual convention, Atlantic City, N. J.
18-22 National Safety Council, Chicago.

November

1-5 National Metal Exposition, Chicago.
4 Midwest Industrial Gas Council, fall meeting, La Salle Hotel, Chicago.
8-11 American Petroleum Institute, Conrad Hilton Hotel, Chicago.
8-12 National hotel exposition, Kingsbridge Armory, New York.
17-19 Wisconsin Utilities Association, gas and electric sections convention, Schroeder Hotel, Milwaukee, Wis.
28-December 3 The American Society of Mechanical Engineers, Statler Hotel, New York.

December

6-7 SGA advisory council and management conference, Point Clear, Ala.

January, 1955

13-20 National housewares & home appliance exhibits, Navy Pier, Chicago.

February, 1955

7-11 Western winter radio-television and appliance market, Western Merchandise Mart, San Francisco.

March, 1955

7-9 Mid-West Gas Association, St. Paul Hotel, St. Paul, Minn.
24-25 AGA gas supply, transmission and storage conference, Wm. Penn Hotel, Pittsburgh.
24-25 Oklahoma Utilities Association convention, Mayo Hotel, Tulsa, Okla.

April, 1955

12-14 AGA sales conference on Industrial and commercial gas, Hotel Statler, Boston, Mass.
12-15 AGA distribution, motor vehicles and corrosion conference, Netherland Plaza, Cincinnati, O.
19-21 Southwestern gas measurement short course, University of Oklahoma, Norman, Okla.
25-27 Mid-West regional gas sales conference, Edgewater Beach Hotel, Chicago.

May, 1955

9-13 National restaurant exposition, Navy Pier, Chicago.
16-18 Southern Gas Association, New Orleans, La.
23-25 GAMA annual meeting, Ambassador Hotel, Los Angeles.

June, 1955

5-9 Canadian Gas Association, annual meeting, General Brock Hotel, Niagara Falls, Ontario, Canada.
9-10 Natural Gas and Petroleum Association of Canada, Royal Connaught Hotel, Hamilton, Ontario, Canada.
26-29 Michigan Gas Association, Grand Hotel, Mackinac Island, Mich.

July, 1955

18-22 Western summer radio-television and appliance market, Western Merchandise Mart, San Francisco.

PROFESSIONAL DIRECTORY

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